6218 Wireless Router

User's Guide

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PARADYNE®

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⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
3. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
4. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
5. General purpose cables are used with this product for connection to the network. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer. Use a UL Listed, CSA certified, minimum No. 24 AWG line cord for connection to the Digital Subscriber Line (DSL) network.
6. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
7. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are interconnected, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
8. Input power to this product must be provided by one of the following: (1) a UL Listed/CSA certified power source with a Class 2 or Limited Power Source (LPS) output for use in North America, or (2) a certified transformer, with a Safety Extra Low Voltage (SELV) output having a maximum of 240 VA available, for use in the country of installation.
9. In addition, since the equipment is to be used with telecommunications circuits, take the following precautions:
   - — Never install telephone wiring during a lightning storm.
   - — Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
   - — Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
   - — Use caution when installing or modifying telephone lines.
   - — Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
   - — Do not use the telephone to report a gas leak in the vicinity of the leak.

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When the product is marked with the CE mark on the equipment label, a supporting Declaration of Conformity may be downloaded from the Paradyne World Wide Web site at **www.paradyne.com**. Select *Library* → *Technical Manuals* → *CE Declarations of Conformity*.

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by the responsible party.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice to Users of the United States Telephone Network

The following notice applies to versions of the modem that have been FCC Part 68 approved.

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council for Terminal Attachment (ACTA). On the bottom side of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the Telephone Company.

This equipment is intended to connect to the Public Switched Telephone Network through a Universal Service Order Code (USOC) type RJ11C jack. A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It has been designed to be connected to a compatible modular jack that is also compliant.

The Ringer Equivalence Number (or REN) is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local Telephone Company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point. For example, 03 represents a REN of 0.3.

If the modem causes harm to the telephone network, the Telephone Company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the Telephone Company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The Telephone Company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the Telephone Company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service. If trouble is experienced with the modem, refer to the repair and warranty information in this document.

If the equipment is causing harm to the telephone network, the Telephone Company may request that you disconnect the equipment until the problem is resolved.

The user may make no repairs to the equipment.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If the site has specially wired alarm equipment connected to the telephone line, ensure the installation of the modem does not disable the alarm equipment. If you have questions about what will disable alarm equipment, consult your Telephone Company or a qualified installer.

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Place of Issue:

Paradyne Corporation
8545 126th Avenue North
Largo, FL 33773-1502
USA

Date of Issue: TBD

Paradyne Corporation, located at the above address, hereby certifies that the Model Number 6218-AX-XXX (where X may be any numeric character) bearing labeling identification number US:AW2DL04B6388-AX complies with: the Federal Communications Commission's ("FCC") Rules and Regulations 47 CFR Part 68, the Administrative Council on Terminal Attachments ("ACTA")-adopted technical criteria TIA-968-A, "Telecommunications - Telephone Terminal Equipment -Technical Requirements for Connection of Terminal Equipment To the Telephone Network, October 2002."

Patrick Murphy

Senior Vice President, Chief Financial Officer

Notice to Users of the Canadian Telephone Network

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation IC before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is labeled on the equipment. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

If your equipment is in need of repair, contact your local sales representative, service representative, or distributor directly.

⚠ CANADA - EMI NOTICE:

This Class B digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du règlement sur le matérial brouilleur du Canada.

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取扱説明書に従って正しい取り扱いをして下さい。

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

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About This Guide

Document Purpose and Intended Audience

This guide contains detailed information about the 6218 wireless router. It is intended for all users of the router.

Document Summary

Section	Description
Chapter 1, Introduction	Describes the features of the router.
Chapter 2, Hardware Installation and PC Setup	Shows how to connect the router and set up your PC to manage the router.
Chapter 3, Using the Web Interface	Explains how to use the web interface to configure and monitor the router.
Chapter 4, *Troubleshooting*	Contains tips on troubleshooting common problems.
Appendix A, Terminology	Explains some major internetworking concepts.
Index	Lists key terms, concepts, and sections in alphabetical order.

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To order a paper copy of a Paradyne document, or to speak with a sales representative, please call 1-727-530-2000.

Introduction

1

Definitions

Before you install or use your new router, you may find it helpful to understand the following terms:

- A **bridge** is a device that forwards any message from one part of a network to another.
- A **router** is a device that forwards messages according to their network addresses.
- **ADSL** is Asymmetric Digital Subscriber Line, a version of DSL that allows a higher speed for information coming from the Internet to your PC ("downstream") than it does for information going to the Internet from your PC ("upstream").

The Model 6218 is a Digital Subscriber Line (DSL) modem that may be set by you to run in bridge or router mode. Because it is most frequently used as a router, that is how it is referred to in this manual.

Features of the 6218 Wireless Router

Your router has the following features:

- 4-Port 10/100BaseT Layer 2 Ethernet switch
- Support for ADSL2+
- Support for wireless protocols 802.11b and 802.11g
- The ability to connect multiple PCs to the Internet with just one WAN IP Address (when configured in router mode with NAT enabled)
- A user-friendly web interface for configuration and monitoring
- Single-session IPSec and PPTP passthrough for Virtual Private Network (VPN)
- Preconfigured port settings for many popular games
- Ability to act as a DHCP Server on your network

- Compatibility with virtually all standard Internet applications
- Address filtering and DMZ hosting
- Downloadable flash software upgrades
- Support for up to eight Permanent Virtual Circuits (PVCs)
- Support for up to eight PPPoE sessions

System Requirements

In order to use your modem for Internet access, you must have the following:

- ADSL service subscription from your ISP.
- One computer with an Ethernet 10/100BaseT network interface card (NIC).
- For system monitoring or configuration using the supplied web interface, a web browser such as Internet Explorer Version 5.5 or later.

Ports and Buttons (Back Panel)

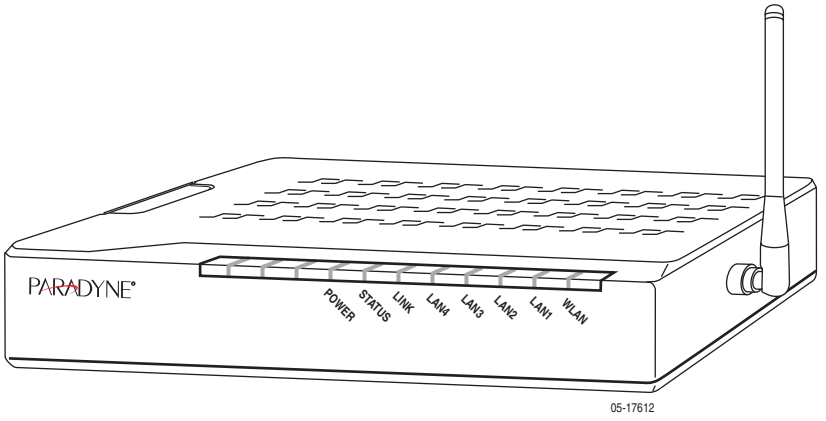
- LINE port: This is the DSL interface which connects directly to your phone line.
- PHONE port: This allows a phone to directly connect to the router. You do not need to add splitter to the phone you connect here, since the router has an internal splitter.
- RESET Button: The RESET button is used to reset the router to the factory default settings. Do not use the RESET button unless advised to by your service representative.
- LAN 1–4 (Local Area Network) port(s): connect to Ethernet network devices, such as a PC, hub, switch, or router. Depending on the device connected, you may need a crossover cable or a straight-through cable.
- POWER is where you connect the power supply.
- ON/OFF: Controls power to the router. The router is on when this button is in its down position, and off when the button is in its up position.

LED Description (Front Panel)

- Power LED: On indicates that the power is supplied to the router.
- Status LED: The Status LED serves two purposes. If the LED is continuously lit, the DSL interface is successfully connected to a device through the LINE port. If the LED is flickering, it is an indication that the router is training (negotiating the connection to its partner modem).
- Link LED: The Activity LED shows the state of the PPPoA or PPPoE connection. Off: no PPP connection is established or the connection is not used. Blinking: a PPP connection is being attempted. Solid green: a PPP

connection is established. Flickering: a PPP connection is established and there is activity on the link.

- LAN 1–4 LED: Each LAN LED serves two purposes. If the LED is continuously lit, the Ethernet interface is successfully connected to a device through the LAN port. If the LED is flickering, it is an indication of network activity.
- WLAN: Solid green: the wireless LAN is enabled. Flickering: there is activity on the wireless LAN.



Packing List

- Your router is shipped with the following:
- Power adapter
- Ethernet cable (RJ45, straight-through wiring)
- Phone cable (RJ11)
- CD-ROM containing this manual

Hardware Installation and PC Setup

2

Overview

This chapter provides basic instructions for connecting the router to a computer or a LAN and to the Internet using DSL. The first part provides instructions to set up the hardware, and the second part describes how to prepare your PC for use with the router. Refer to Chapter 3, *Using the Web Interface* for router configuration instructions.

It is assumed that you have already subscribed to DSL service with your Internet service provider (ISP).

Connecting the Hardware

Shut down your PC and any other equipment before connecting it to the router. To connect your router:

▶ Procedure

1. Connect the supplied modular phone cable to the LINE port, and connect the other end of the cable to your phone jack.
2. If you would like to use a phone in the vicinity of the router, connect it to the PHONE jack of the router using the cord that came with your telephone. The router has an internal POTS filter, so you do not need to install one here.
3. Use the included Ethernet cable to connect your computer to the router. Attach one end of the Ethernet cable to one of the LAN ports on the back of the router and connect the other end to the Ethernet port or Network Interface Card (NIC) in your PC.

   Connect any other PCs, hubs, and switches to the remaining LAN ports. Either a crossover or a straight-through Ethernet cable can be used: the router determines and adjusts to the type of signal required.
4. Connect the cylindrical power plug into the POWER connector on the back of the device. Next:

   — If you have a wall-mount adapter, plug the AC adapter into a wall outlet or a power strip.

— If you have a table-top adapter, use the AC power cord to connect the adapter to a wall outlet or power strip.

The supplied power adapter may look different than the one illustrated here.

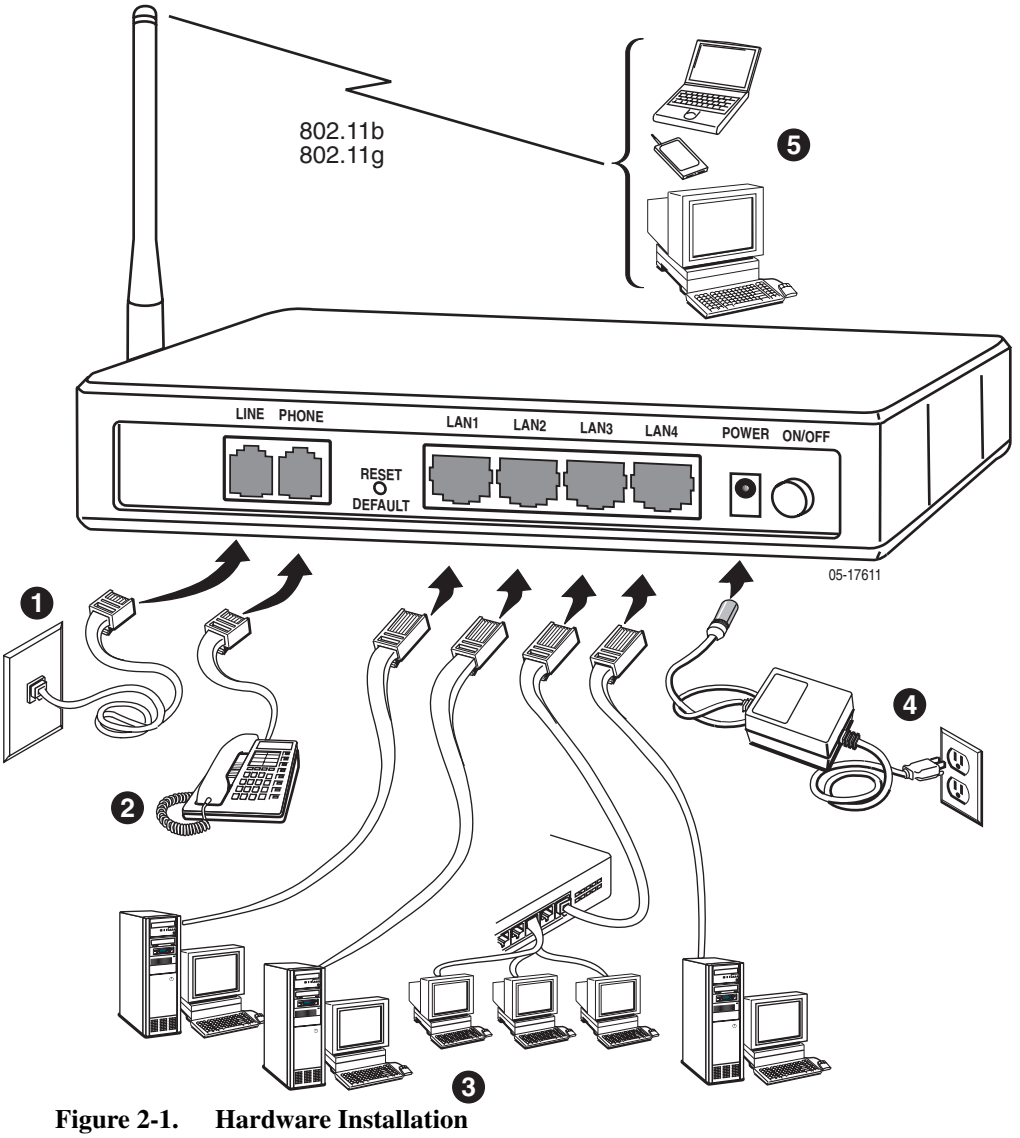


Figure 2-1. Hardware Installation

5. Configure your router and your wireless devices to communicate with each other.

Turn on your PC any other LAN devices, such as hubs or switches.

Configuring Your PC's IP Address

Before you start to access the router using the Ethernet connection, you must configure your PC to use DHCP, or change your PC's TCP/IP address to be 192.168.1.x, where x is any number between 2 and 254, with a subnet mask of 255.255.255.0.

Your router's default IP address is 192.168.1.1.

Assigning an IP Address to your PC Automatically by DHCP

To use the router's DHCP feature, click in the radio button labeled "Obtain an IP address automatically" instead of "Use the following IP address" in the following procedures.

By default, the LAN port IP address of the router is 192.168.1.1. (You can change this address, or another address can be assigned by your ISP.)

Windows XP

To configure the IP address under Windows XP:

▶ Procedure

1. In the Windows task bar, click on the Start button, and then click on Control Panel.
2. Double-click on the Network Connections icon.
3. In the LAN or High-Speed Internet window, right-click on the icon corresponding to your network interface card (NIC) and select Properties. (Often this icon is labeled Local Area Connection). The Local Area Connection dialog box is displayed with a list of currently installed network items.

4. Ensure that the check box to the left of the item labeled Internet Protocol (TCP/IP) is checked, and click on Properties.

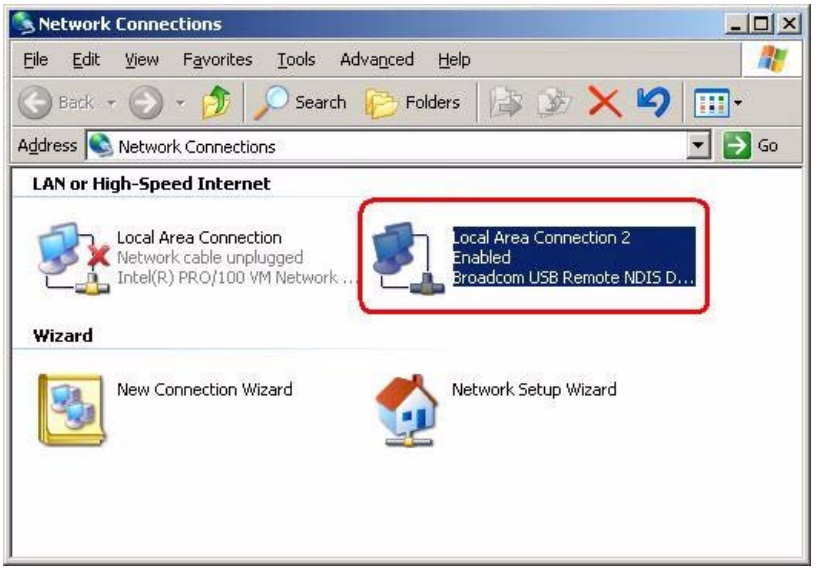


Figure 2-2. Network Connections in Windows XP

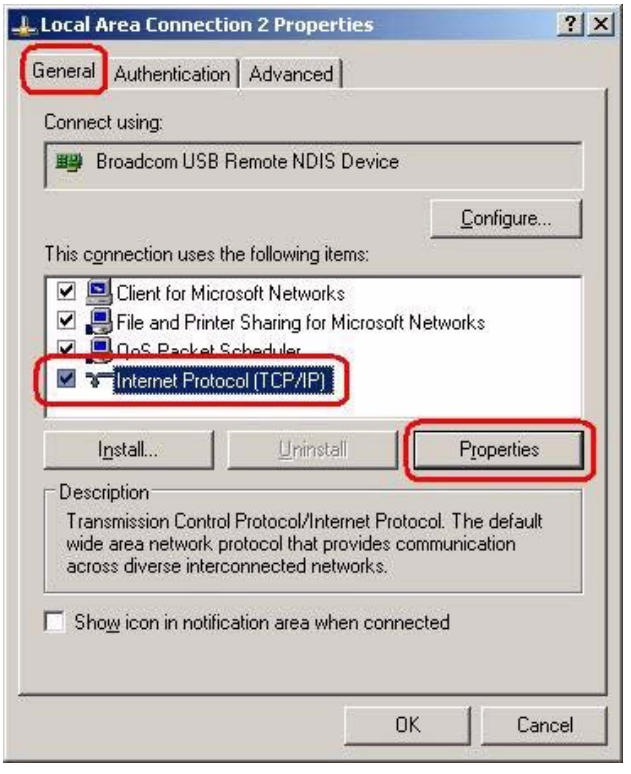


Figure 2-3. Local Area Connection Properties in Windows XP

5. In the Internet Protocol (TCP/IP) Properties dialog box, click in the radio button labeled “Use the following IP address” and type 192.168.1.x (where x is any number between 2 and 254) in the IP Address field. Type 255.255.255.0 in the Subnet Mask field.

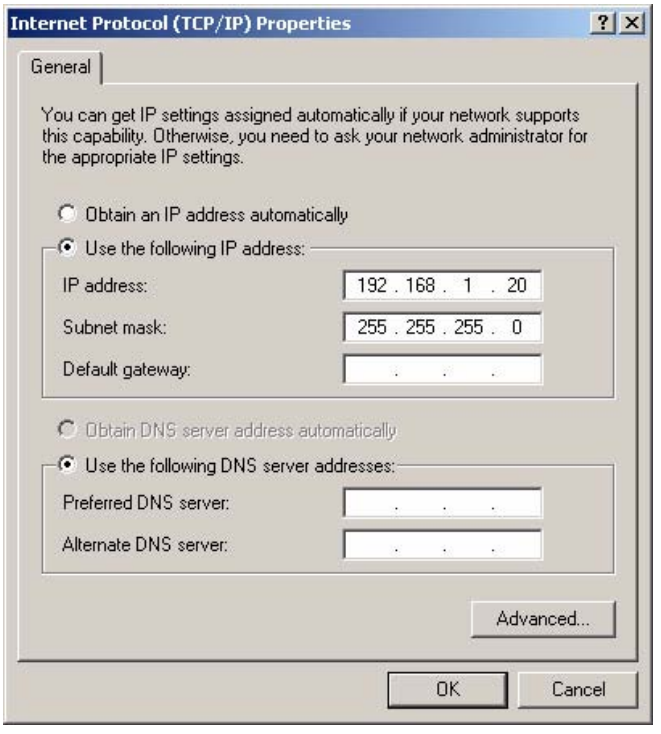

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 20
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure 2-4. TCP/IP Properties in Windows XP

6. Click on OK twice to confirm your changes, and close the Control Panel.

Windows 2000

To configure the IP address under Windows 2000:

▶ Procedure

1. In the Windows task bar, click on the Start button, point to Settings, and then select Control Panel.
2. Double-click on the Network and Dial-up Connections icon.
3. In the Network and Dial-up Connections window, right-click on the Local Area Connection icon, and then select Properties.

   The Local Area Connection Properties dialog box is displayed with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), the protocol has already been enabled, in which case you can skip to Step 10.

4. If Internet Protocol (TCP/IP) does not appear as an installed component, click on Install.
5. In the Select Network Component Type dialog box, select Protocol, and then click on Add.
6. Select Internet Protocol (TCP/IP) in the Network Protocols list, and then click on OK.

   You may be prompted to install files from your Windows 2000 installation CD or other media. Follow the instructions to install the files.
7. If prompted, click on OK to restart your computer with the new settings.
8. After restarting your PC, double-click on the Network and Dial-up Connections icon in the Control Panel.
9. In Network and Dial-up Connections window, right-click on the Local Area Connection icon, and then select Properties.
10. In the Local Area Connection Properties dialog box, select Internet Protocol (TCP/IP), and then click on Properties.
11. In the Internet Protocol (TCP/IP) Properties dialog box, click in the radio button labeled “Use the following IP address” and type 192.168.1.x (where x is any number between 2 and 254) in the IP Address field. Type 255.255.255.0 in the Subnet Mask field.
12. Click on OK twice to confirm and save your changes, and then close the Control Panel.

Windows ME

To configure the IP address under Windows ME:

▶ Procedure

1. In the Windows task bar, click on the Start button, point to Settings, and then click on Control Panel.
2. Double-click on the Network and Dial-up Connections icon.
3. In the Network and Dial-up Connections window, right-click on the Network icon, and then select Properties.

   The Network Properties dialog box is displayed with a list of currently installed network components. If the list includes Internet Protocol (TCP/IP), the protocol has already been enabled, in which case you can skip to Step 11.
4. If Internet Protocol (TCP/IP) does not appear as an installed component, click on Add.
5. In the Select Network Component Type dialog box, select Protocol, and then click on Add.
6. Select Microsoft in the Manufacturers box.
7. Select Internet Protocol (TCP/IP) in the Network Protocols list, and then click on OK.

You may be prompted to install files from your Windows ME installation CD or other media. Follow the instructions to install the files.

8. If prompted, click on OK to restart your computer with the new settings.
9. After restarting your PC, double-click on the Network and Dial-up Connections icon in the Control Panel.
10. In Network and Dial-up Connections window, right-click on the Network icon, and then select Properties.
11. In the Network Properties dialog box, select TCP/IP, and then click on Properties.
12. In the TCP/IP Settings dialog box, click in the radio button labeled “Use the following IP address” and type 192.168.1.x (where x is any number between 2 and 254) in the IP Address field. Type 255.255.255.0 in the Subnet Mask field.
13. Click on OK twice to confirm and save your changes, and then close the Control Panel.

Windows 95, 98

To configure the IP address under Windows 95 or Windows 98:

▶ Procedure

1. In the Windows task bar, click on the Start button, point to Settings, and then click on Control Panel.
2. Double-click on the Network icon.

   The Network dialog box is displayed with a list of currently installed network components. If the list includes TCP/IP, the protocol has already been enabled, in which case you can skip to Step 9.
3. If TCP/IP does not appear as an installed component, click on Add. The Select Network Component Type dialog box appears.
4. Select Protocol, and then click on Add. The Select Network Protocol dialog box appears.
5. Click on Microsoft in the Manufacturers list box, and then click on TCP/IP in the Network Protocols list box.
6. Click on OK to return to the Network dialog box, and then click on OK again.

   You may be prompted to install files from your Windows 95/98 installation CD. Follow the instructions to install the files.
7. Click on OK to restart the PC and complete the TCP/IP installation.
8. After restarting your PC, open the Control Panel window, and then click on the Network icon.
9. Select the network component labeled TCP/IP, and then click on Properties.

   If you have multiple TCP/IP listings, select the listing associated with your network card or adapter.

10. In the TCP/IP Properties dialog box, click on the IP Address tab.
11. Click in the radio button labeled “Use the following IP address” and type 192.168.1.x (where x is any number between 2 and 254) in the IP Address field. Type 255.255.255.0 in the Subnet Mask field.
12. Click on OK twice to confirm and save your changes. You will be prompted to restart Windows. Click on Yes and restart your PC again.

Windows NT 4.0

To configure the IP address under Windows NT 4.0:

▶ Procedure

1. In the Windows NT task bar, click on the Start button, point to Settings, and then click on Control Panel.
2. In the Control Panel window, double click on the Network icon.
3. In the Network dialog box, click on the Protocols tab.

   The Protocols tab displays a list of currently installed network protocols. If the list includes TCP/IP, the protocol has already been enabled, in which case you can skip to Step 9.
4. If TCP/IP does not appear as an installed component, click on Add.
5. In the Select Network Protocol dialog box, select TCP/IP, and then click on OK.

   You may be prompted to install files from your Windows NT installation CD or other media. Follow the instructions to install the files.

   After all files are installed, a window displays to inform you that a TCP/IP service called DHCP can be set up to dynamically assign IP information.
6. Click on Yes to continue, and then click on OK if prompted to restart your computer.
7. After restarting your PC, open the Control Panel window, and then double-click on the Network icon.
8. In the Network dialog box, click on the Protocols tab.
9. In the Protocols tab, select TCP/IP, and then click on Properties.
10. In the Microsoft TCP/IP Properties dialog box, click in the radio button labeled Use the following IP address and type 192.168.1.x (where x is any number between 2 and 254) in the IP Address field. Type 255.255.255.0 in the Subnet Mask field.
11. Click on OK twice to confirm and save your changes, and then close the Control Panel.

Using the Web Interface

3

Logging Into Your Router

To configure your router, open your web browser. Ignore any error about lacking a connection. Type the default IP address (192.168.1.1) into the Location field of your browser and press the Enter key. The following screen appears.

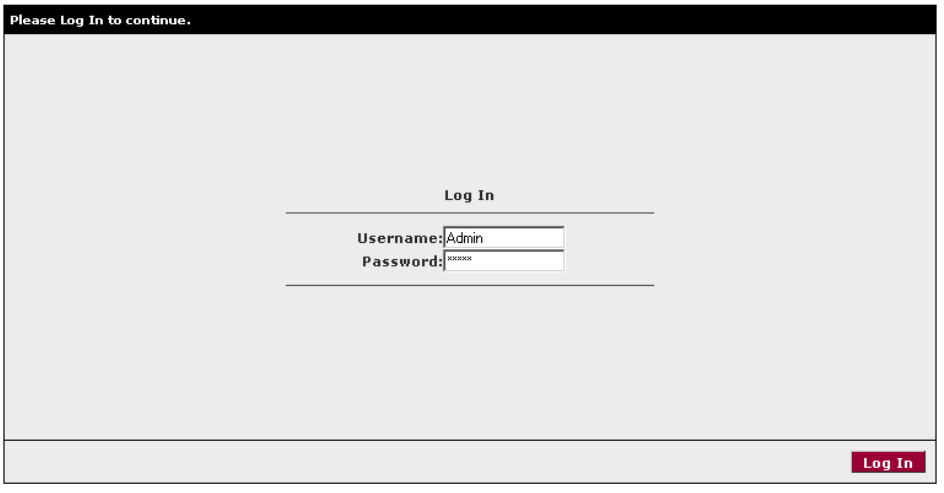


Figure 3-1. Login Screen

The default user name is Admin and the password is Admin. Both are case-sensitive.

Note: Before configuring your router, make sure you have followed the instructions in Chapter 2, *Hardware Installation and PC Setup*. You should have your PCs configured for DHCP mode (if your router will be), and have proxies disabled on your browser. If you see a login redirection screen when you access the web interface, verify that JavaScript support is enabled in your browser. Also, if you do not get the screen shown in Figure 3-1, you may need to delete your temporary Internet files.

Home Page

The first screen (Figure 3-2) that appears after the log in screen is the Home page. From this screen you can configure the LAN and WAN connections, configure the router's security, routing, and filtering, access debugging tools, obtain the status of the router, and view the online help.

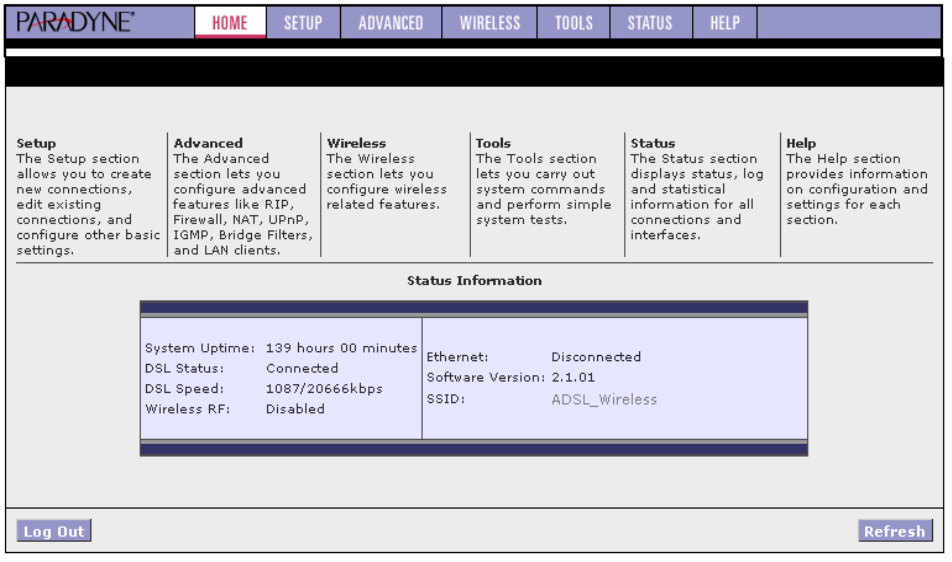

PARADYNE
HOME
SETUP
ADVANCED
WIRELESS
TOOLS
STATUS
HELP
Setup
The Setup section allows you to create new connections, edit existing connections, and configure other basic settings.
Advanced
The Advanced section lets you configure advanced features like RIP, Firewall, NAT, UPnP, IGMP, Bridge Filters, and LAN clients.
Wireless
The Wireless section lets you configure wireless related features.
Tools
The Tools section lets you carry out system commands and perform simple system tests.
Status
The Status section displays status, log and statistical information for all connections and interfaces.
Help
The Help section provides information on configuration and settings for each section.
Status Information
System Uptime: 139 hours 00 minutes
DSL Status: Connected
DSL Speed: 1087/20666kbps
Wireless RF: Disabled
Ethernet: Disconnected
Software Version: 2.1.01
SSID: ADSL_Wireless
Log Out
Refresh

Figure 3-2. Home Page

The basic layout of the Home page consists of a page selection list across the top of the browser window. The footer displays router status, connection information, and other useful information. The center display is where most of the configuration will take place.

Click on Log Out to close the session. Click on Refresh to update the status display.

Setup

To set up LAN and WAN options, select Setup from the Home page. Figure 3-3 shows the Setup page. The menu is broken into two sections: the WAN configuration and the LAN configuration.

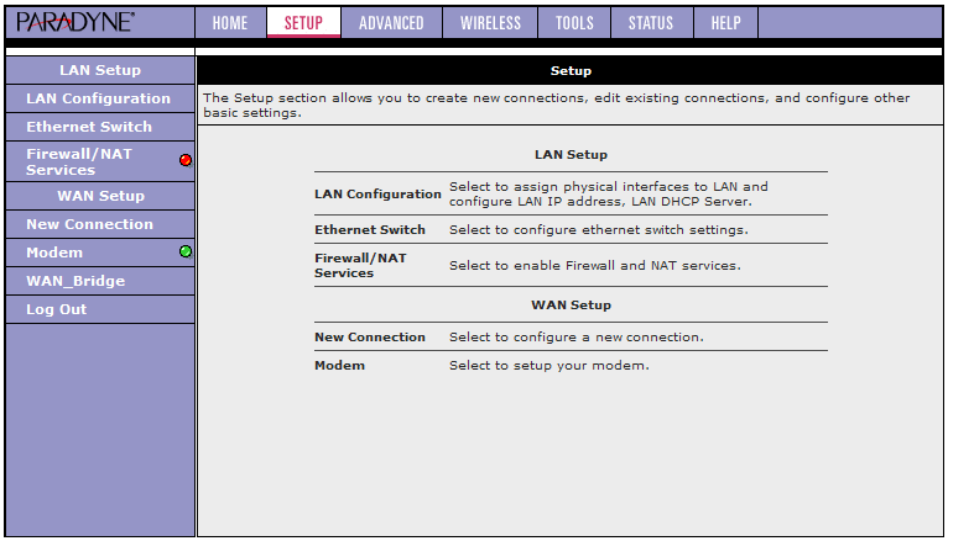


Figure 3-3. Setup Options

Wide Area Network Connection

The DSL (LINE) connection is the Wide Area Network (WAN) connection. It is also referred to as a broadband connection. The requirements for the WAN connection depend on your Internet Service Provider (ISP). Most of the configuration you will perform will be in this area.

Local Area Network Connection

On the other side of your router are your own Local Area Network (LAN) connections. This is where you plug in your local computers to the router. The router is normally configured to automatically provide all the PCs on your network with Internet addresses.

If you connected a PC (rather than a hub or a switch) directly to the router, your LAN consists of that PC.

Saving Changes

Note that the Apply button temporarily saves changes you make. To make changes permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Configuring the WAN

Before the router will pass any data between the LAN interface and the WAN interface, the WAN side of the router must be configured. Depending upon your ISP, you will need some or all of the information listed below before you can properly configure the WAN:

- Your DSL line's Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI)
- Your DSL encapsulation type and multiplexing mode
- Your DSL training mode (default is MMODE)

If you use PPPoA or PPPoE, you also need these values from your ISP:

- Your username and password

If you use multiprotocol encapsulation over ATM Adaptation Layer 5 (as described in RFC 1483), you may need these values from your ISP:

- Your DSL fixed Internet IP address
- Your subnet mask
- Your default gateway IP address
- Your primary DNS IP address

Since multiple users can use the router, the router can simultaneously support multiple connection types. You must set up different profiles for each connection. The router supports the following protocols:

- DHCP
- PPPoA (RFC 2364)
- PPPoE (RFC 2516)
- Static
- Bridged

New Connection

A new connection is basically a virtual connection. Your router can support up to 8 different virtual connections. If you have multiple different virtual connections, you may need to utilize the static and dynamic routing capabilities of the router to pass data correctly.

PPPoE Connection Setup

PPPoE is defined in the Internet standard RFC 2516. It is a method of encapsulating PPP packets over Ethernet. PPP (Point-to-Point Protocol) is a method of establishing a network session between network hosts. It usually provides a mechanism of authenticating users.

To configure the CPE for PPPoE:

▶ Procedure

1. Click on Setup and then click on New Connection. The default PPPoE connection setup is displayed.
2. At the Type field, select PPPoE from the drop-down list. The PPPoE Connection Setup page is displayed.
3. Give your PPPoE connection a unique name. The name must not have spaces and cannot begin with numbers.
4. Select a PVC Sharing type of Disable, Enable, or VLAN.
5. Select or enter a VPI and VCI (as supplied by your DSL service provider or your ISP), or click in Auto PVC. Auto PVC causes the router to perform automatic VPI/VCI detection as defined in DSL forum TR-068.

   Caution:

   Use Auto PVC only for DSLAMs with an ATM uplink. Do not use Auto PVC with IP DSLAMs.
6. For VLAN, specify a VLAN ID and priority.
7. Select NAT and Firewall if you want them active for this connection. Firewall and NAT services must be enabled. See *Firewall/NAT Services* on page 3-17.
8. Select the quality of service (QOS). Leave the default value if your ISP did not provide this information. Depending on the QoS you select, you may also enter:
   - PCR (Peak Cell Rate)
   - SCR (Sustainable Cell Rate)
   - MBS (Maximum Burst Size)
   - CDVT (Cell Delay Variation Tolerance)

Following is a description of the different options:

- Username - The username for the PPPoE access. This is provided by your DSL service provider or your ISP.
- Password - The password for the PPPoE access. This is provided by your DSL service provider or your ISP.
- Idle Timeout - Specifies that PPPoE connection should disconnect if the link has no activity detected for the specified number of seconds. This field is used in conjunction with the On Demand feature. To disable the timeout feature, enter a zero in this field.
- Authentication – Specifies the authentication protocol: Auto (the protocol is selected by the PPPoE server), PAP (Password Authentication Protocol), or CHAP (Challenge Handshake Authentication Protocol).
- Keep Alive - When the On Demand option is not enabled, this value specifies the length of time to keep the connection from being shut down for inactivity by sending PPP LCP echoes to the PPP server. To ensure that the link is always active, enter a zero in this field.
- MTU - The Maximum Transmission Unit the DSL connection can send. It is a negotiated value. The maximum specified value is 1500, although some DSL/ISP providers require a larger value. The minimum MTU value is 128.
- On Demand - Enables on-demand mode. The connection will disconnect if no activity is detected after the specified idle timeout value.
- Default Gateway – Specifies whether a default gateway is used.
- Enforce MTU - Check this box if you experience problems accessing the Internet over a PPPoE connection. This feature will force all TCP traffic to conform with PPP MTU by changing TCP Maximum Segment Size to the PPP MTU.
- Debug - Enables PPPoE connection debugging facilities. Debugging is talked about later.
- PPP Unnumbered – Specifies that the calling and answering routers will not request IP addresses.

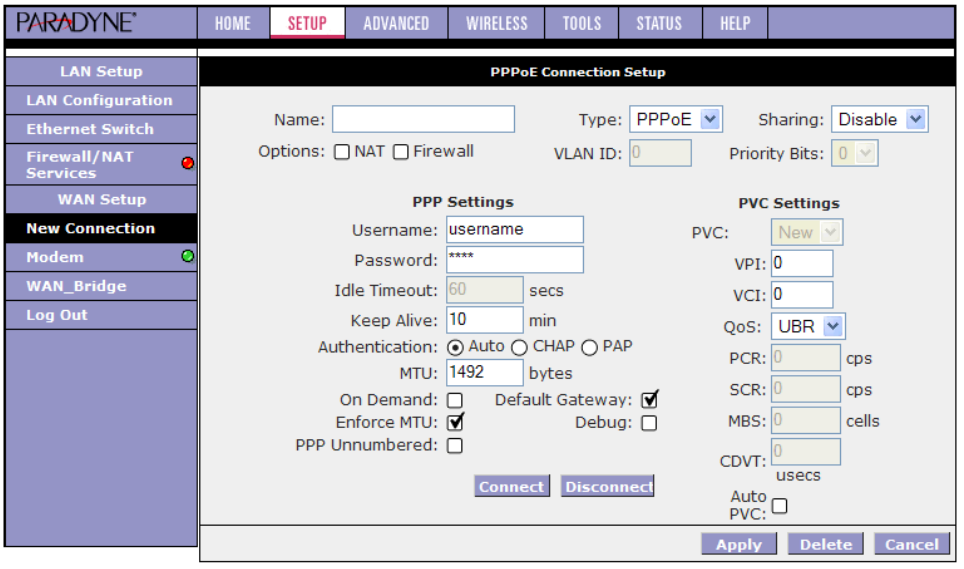


Figure 3-4. PPPoE Connection Setup

To complete the connection you must now click the Apply button. The Apply button will temporarily save this connection. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

PPPoA Connection Setup

PPPoA is defined in the Internet standard RFC 2364. It is a method of encapsulating PPP packets over ATM cells which are carried over the DSL line. PPP (Point-to-Point Protocol) is a method of establishing a network session between network hosts. It usually provides a mechanism of authenticating users. LLC and VC are two different methods of encapsulating the PPP packet. Contact your ISP to make sure which encapsulation is being supported.

By selecting PPPoA, you are forcing your router to act as the termination point for the PPPoA connection. This frees up your PC resources and allows multiple users to utilize the PPPoA connection.

To configure the router for PPPoA:

▶ Procedure

1. Click on Setup and then click on New Connection. The default PPPoE connection setup is displayed.
2. At the Type field, select PPPoA from the drop-down list. The PPPoA connection setup page is displayed.
3. Give your PPPoA connection a unique name. The name must not have spaces and cannot begin with numbers.

4. Select or enter a VPI and VCI (as supplied by your DSL service provider or your ISP), or click in Auto PVC. (Auto PVC causes the router to perform automatic VPI/VCI detection as defined in DSL forum TR-068.)
5. Select NAT and Firewall if you want them active for this connection. Firewall and NAT services must be enabled. See *Firewall/NAT Services* on page 3-17.
6. Select the encapsulation type (LLC or VC); if you are not sure just use the default mode.
7. Select the quality of service (QOS). Leave the default value if your ISP did not provide this information. Depending on the QoS you select, you may also enter:
   - PCR (Peak Cell Rate)
   - SCR (Sustainable Cell Rate)
   - MBS (Maximum Burst Size)
   - CDVT (Cell Delay Variation Tolerance)

Following is a description of the different options:

- Username – The username for the PPPoA access. This is provided by your DSL service provider or your ISP.
- Password – The password for the PPPoA access. This is provided by your DSL service provider or your ISP.
- Idle Timeout – Specifies that PPPoA connection should disconnect if the link has no activity detected for the specified number of seconds. This field is used in conjunction with the On Demand feature. To disable the timeout feature, enter a zero in this field.
- Authentication – Specifies the authentication protocol: Auto (the protocol is selected by the PPPoA server), PAP (Password Authentication Protocol), or CHAP (Challenge Handshake Authentication Protocol).
- Keep Alive – When the On Demand option is not enabled, this value specifies the length of time to keep the connection from being shut down for inactivity by sending PPP LCP echoes to the PPP server. To ensure that the link is always active, enter a zero in this field.
- MTU – The Maximum Transmission Unit the DSL connection can send. It is a negotiated value. The maximum specified value is 1500, although some DSL/ISP providers require a larger value. The minimum MTU value is 128.
- On Demand – Enables on-demand mode. The connection will disconnect if no activity is detected after the specified idle timeout value.
- Default Gateway – Specifies whether a default gateway is used.
- Debug – Enables PPPoA connection debugging facilities.
- PPP Unnumbered – Specifies that the calling and answering routers will not request IP addresses.

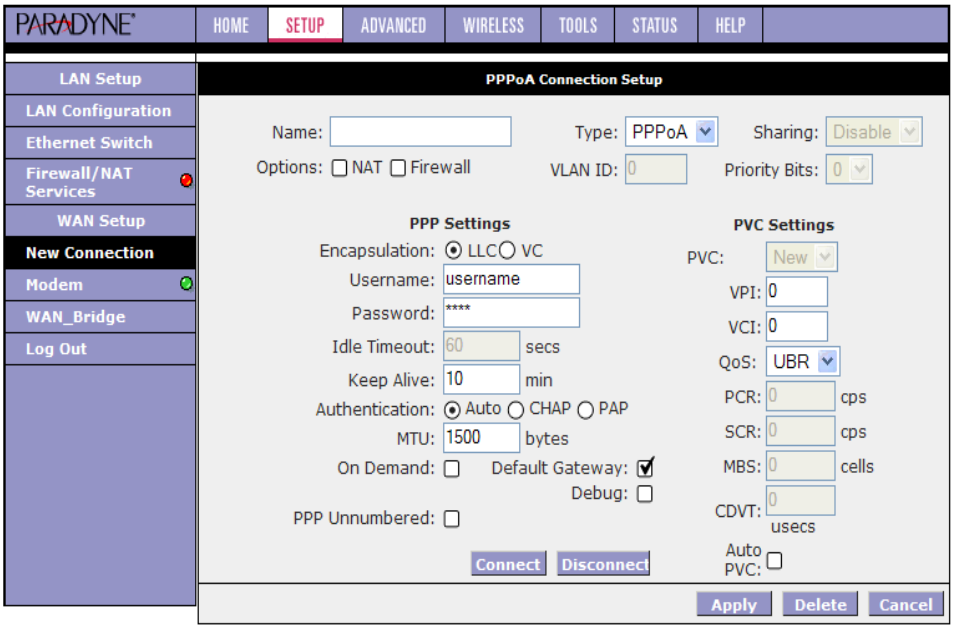


Figure 3-5. PPPoA Connection Setup

To complete the connection you must now click the Apply button. The Apply button will temporarily save this connection. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Static Connection Setup

A static connection is used whenever a known static IP is assigned. The accompanying information such as the subnet mask and the default gateway should also be specified. Up to three Domain Name Server (DNS) addresses can also be specified. These servers give you access to other web servers. The valid range of IP addresses is 1.0.0.0 to 223.255.255.254.

To configure the router for a Static connection:

▶ Procedure

1. Click on Setup and then click on New Connection. The default Static connection setup is displayed.
2. At the Type field, select Static. The Static Connection Setup page is displayed.
3. Give your Static connection a unique name. The name must not have spaces and cannot begin with numbers.
4. Optionally enable Network Address Translation (NAT) and the Firewall options. Firewall and NAT services must be enabled. See *Firewall/NAT Services* on page 3-17.
5. Select a PVC Sharing type of Disable, Enable, or VLAN.

6. Select or enter a VPI and VCI (as supplied by your DSL service provider or your ISP), or click in Auto PVC. (Auto PVC causes the router to perform automatic VPI/VCI detection as defined in DSL forum TR-068.) For VLAN, specify a VLAN ID and priority.
7. Select NAT and Firewall if you want them active for this connection. Firewall and NAT services must be enabled. See *Firewall/NAT Services* on page 3-17.
8. Select the encapsulation type (LLC or VC). If you are not sure which to use, just use the default mode.
9. Based upon the information your ISP provided, enter your assigned IP Address, Subnet Mask, Default Gateway (if provided), and Domain Name Services (DNS) address (if provided). Specify the VPI and VCI settings. Your DSL service provider or your ISP will supply these.
10. Select the quality of service (QOS). Leave the default value if your ISP did not provide this information.
11. Set the mode to Bridged or Routed as instructed by your ISP.

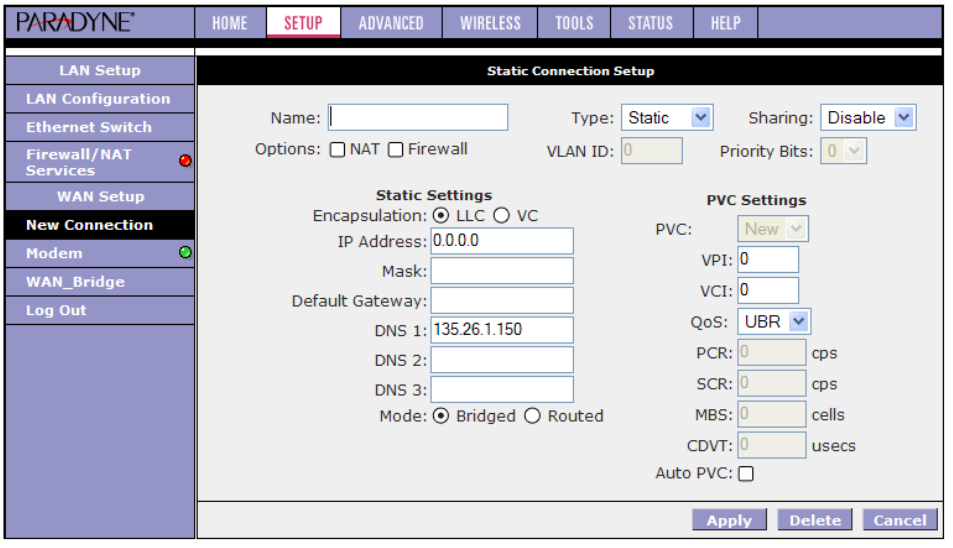


Figure 3-6. Static IP Connection Setup

To complete the connection you must now click the Apply button. The Apply button will temporarily save this connection. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

DHCP Connection Setup

Dynamic Host Configuration Protocol (DHCP) allows the router to automatically obtain the IP address from the server. This option is commonly used in situations where IP is dynamically assigned and is not known prior to assignment.

To configure the router for a DHCP connection:

▶ Procedure

1. Click on Setup and then click on New Connection. The default PPPoE connection setup is displayed.
2. At the Type field, select DHCP. The DHCP connection setup page is displayed.
3. Give your DHCP connection a unique name. The name must not have spaces and cannot begin with numbers.
4. Select a PVC Sharing type of Disable, Enable, or VLAN.
5. Select or enter a VPI and VCI (as supplied by your DSL service provider or your ISP), or click in Auto PVC. (Auto PVC causes the router to perform automatic VPI/VCI detection as defined in DSL forum TR-068.) For VLAN, specify a VLAN ID and priority.
6. Select NAT and Firewall if you want them active for this connection. Firewall and NAT services must be enabled. See *Firewall/NAT Services* on page 3-17.
7. Select the encapsulation type (LLC or VC). If you are not sure which to use, just use the default mode.
8. Select the quality of service (QOS). Leave the default value if your ISP did not provide this information. Depending on the QoS you select, you may also enter:
   - PCR (Peak Cell Rate)
   - SCR (Sustainable Cell Rate)
   - MBS (Maximum Burst Size)
   - CDVT (Cell Delay Variation Tolerance)

If your DSL line is connected and your DSL provider is supporting DHCP, you can click on the Renew button and the CPE will retrieve an IP Address, Subnet Mask, and Default Gateway address. At any time you can renew the DHCP address by clicking on the Renew button.

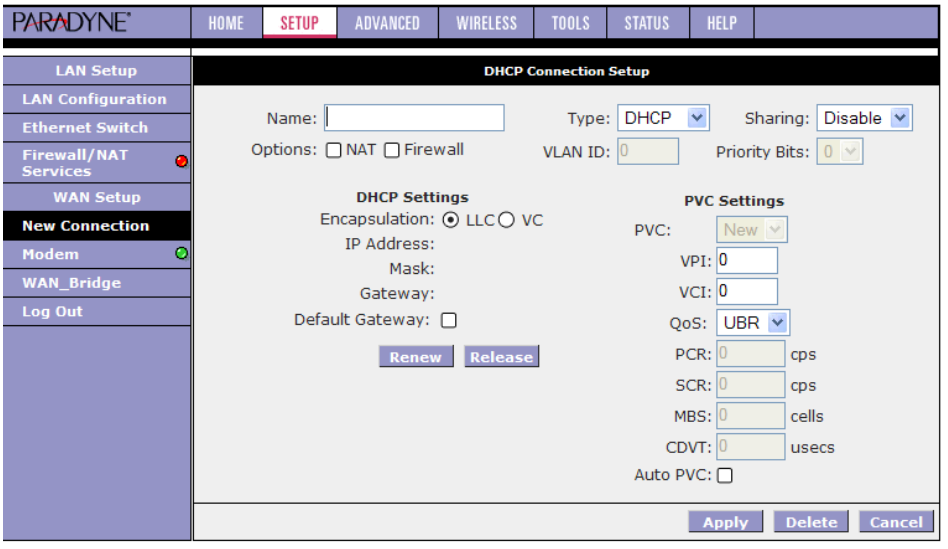


Figure 3-7. DHCP Connection Setup

To complete the connection you must now click the Apply button. The Apply button will temporarily save this connection. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Bridged Connection

A pure bridged connection does not assign an IP address to the WAN interface. This connection method makes the router act as a hub that passes packets across the WAN interface to the LAN interface.

To configure the router as a bridge:

▶ Procedure

1. From the Home page, click on Setup and then click on New Connection. The default PPPoE connection setup is displayed.
2. At the Type field select Bridge. The Bridge connection setup page is displayed (see Figure 3-8).
3. Give your Bridge connection a unique name; the name must not have spaces and cannot begin with numbers.
4. Select a PVC Sharing type of Disable, Enable, or VLAN.
5. Select or enter a VPI and VCI. (Your DSL service provider or your ISP will supply these.) For VLAN, specify a VLAN ID and priority.
6. Select the encapsulation type (LLC or VC); if you are not sure which to use, just use the default mode.

7. Select the quality of service (QoS). Leave the default value if you are unsure or the ISP did not provide this information. Depending on the QoS you select, you may also enter:
   - PCR (Peak Cell Rate)
   - SCR (Sustainable Cell Rate)
   - MBS (Maximum Burst Size)
   - CDVT (Cell Delay Variation Tolerance)

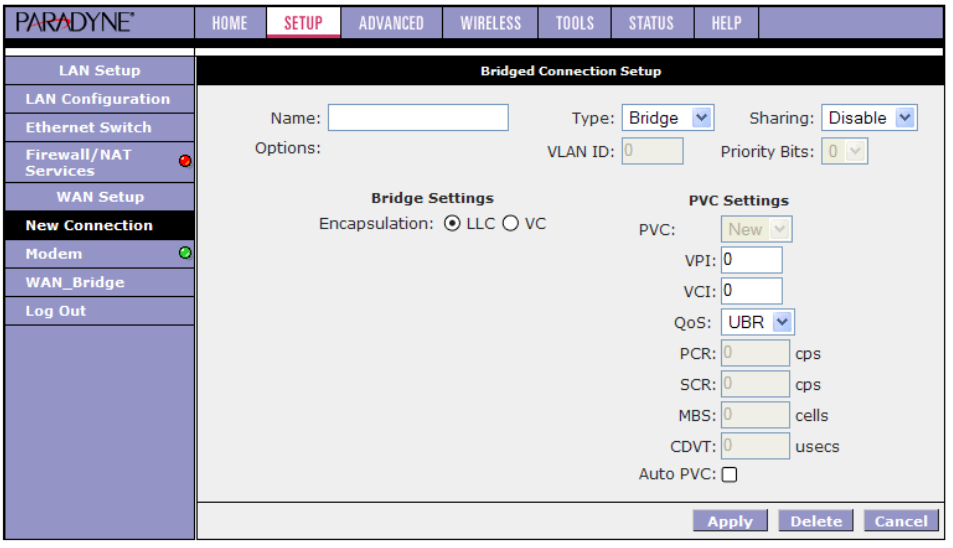


Figure 3-8. Bridged Connection Setup

To complete the connection you must now click the Apply button. The Apply button will temporarily save this connection. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Modify an Existing Connection

To modify an existing connection:

▶ Procedure

1. From the Home screen, click on Setup.
2. Click on the connection you want to modify. The connections are listed by name.

If you delete a connection, to make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Modem Setup

To configure the DSL modulation type:

▶ Procedure

1. From the Home screen, click on Setup.
2. Under WAN Setup, select Modem. This will bring up the Modem Setup screen. Leave the default value if your ISP did not provide this information. For most cases, this screen should not be modified.

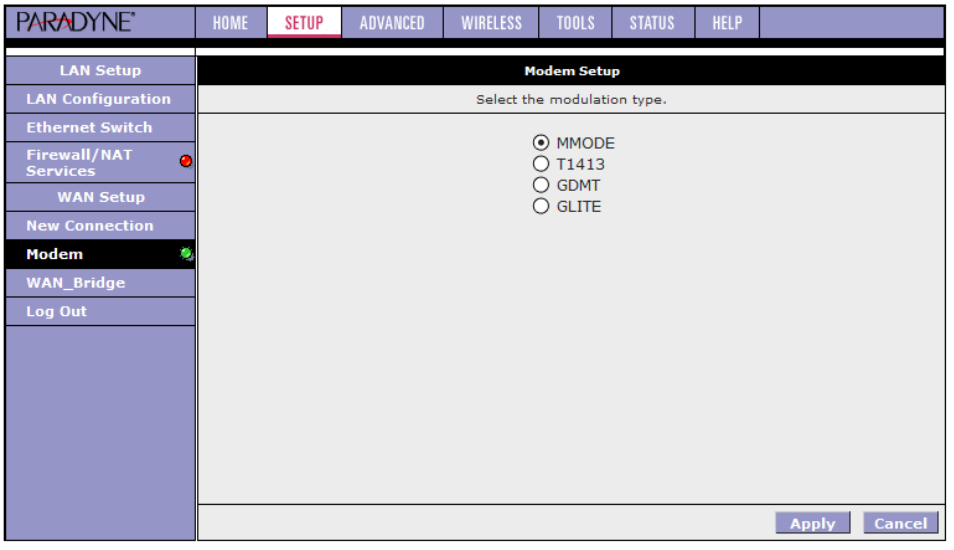


Figure 3-9. Modem Setup

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Configuring the LAN

To configure LAN parameters, click on Setup on the Home screen. Under LAN Setup, click on LAN Configuration. The LAN Configuration screen appears.

Enable/Disable DHCP

By default, your CPE has DHCP server (LAN side) disabled. If you already have a DHCP server running on your network, do not enable a second DHCP server.

To enable DHCP:

▶ Procedure

1. From the Home screen, click on Setup.
2. Under LAN Setup, select LAN Configuration. The LAN Group 1 Configuration screen appears.

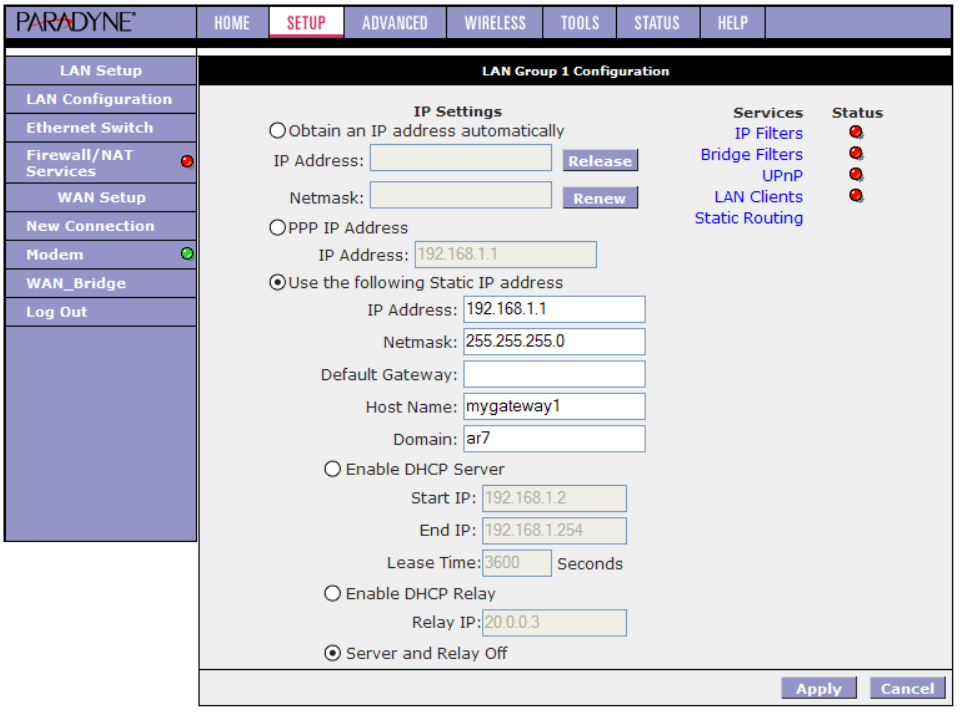


Figure 3-10. LAN Group 1 Configuration

3. The DHCP server is enabled when “Enable DHCP Server” is selected. If you enable it:
   - — Specify a Start IP address. The Start IP Address is where the DHCP server starts issuing IP addresses. This value must be greater than the router's IP address value. For example, if the router's IP address is 192.168.1.1 (the default) than the Start IP address must be 192.168.1. 2 or higher.
   - — Specify an End IP address. The End IP Address is the last address the DHCP server can issue. The ending address cannot exceed a subnet limit of 254. The maximum IP address for a router using the default address is 192.168.1.254. If the DHCP server runs out of DHCP addresses, users will not get access to network resources.
   - — Specify a Lease Time. The Lease Time is the amount of time a network user will be allowed connection to the Router with their current dynamic IP address. The amount of time is in units of seconds; the default value is 3600 seconds (1 hour).

Note: If you change the start or end values, make sure the values are still within the same subnet as the router's IP address. For example, if the router's IP address is 192.168.1.1 (the default), and you change the DHCP Start and End IP addresses to be 192.128.1.2 and 192.128.1.100, you will not be able to communicate with the router if your PC has DHCP enabled.

In addition to the DHCP server feature, the router supports the DHCP relay function. When the router is configured as DHCP server, it assigns the IP addresses to the LAN clients. When the router is configured as DHCP relay, it is responsible for forwarding the requests and responses negotiating between the DHCP clients and the server.

If the DHCP server and relay are turned off, you must configure the IP address, subnet mask and DNS settings of every computer on your network. Do not assign the same IP address to more than one computer. Your router must be on the same subnet as the computers.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Changing the Router's IP address

Your router's default IP address and subnet mask are 192.168.1.1 and 255.255.255.0, respectively. This subnet mask allows the router to support 254 users. Since the DHCP server issues a maximum of 255 addresses, there is not much advantage to changing the subnet mask to increase the number of addresses. Further, remember that if you change your router's IP address and you have DHCP enabled, the DHCP configuration must reside within the same subnet.

The default gateway is the routing device used to forward all traffic that is not addressed to a station within the local subnet. Your ISP will provide you with the default gateway address.

The Hostname can be any alphanumeric word beginning with a letter and containing no spaces. The domain name is used to in conjunction with the host name to uniquely identify the router.

To change the router's IP address:

▶ Procedure

1. From the Home screen, click on Setup.
2. Under LAN Setup, select LAN Configuration. The LAN Group 1 Configuration screen appears, as shown in Figure 3-10, LAN Group 1 Configuration.
3. Click on "Use the following Static IP Address".
4. Enter a new IP Address and Netmask.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Ethernet Switch

To set the speed and duplex mode of the LAN ports:

▶ Procedure

1. From the Home screen, click on Ethernet Switch. The Ethernet Switch screen appears.
2. For Physical Port1 through Physical Port4 (LAN1 through LAN4), select a mode and speed from the Set Value drop-down list. Select Auto to negotiate the Ethernet duplex mode and speed with attached equipment that supports auto-negotiation.

The current configured or negotiated settings are displayed under Fallback Value.

The Apply button will temporarily save the Ethernet Switch settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

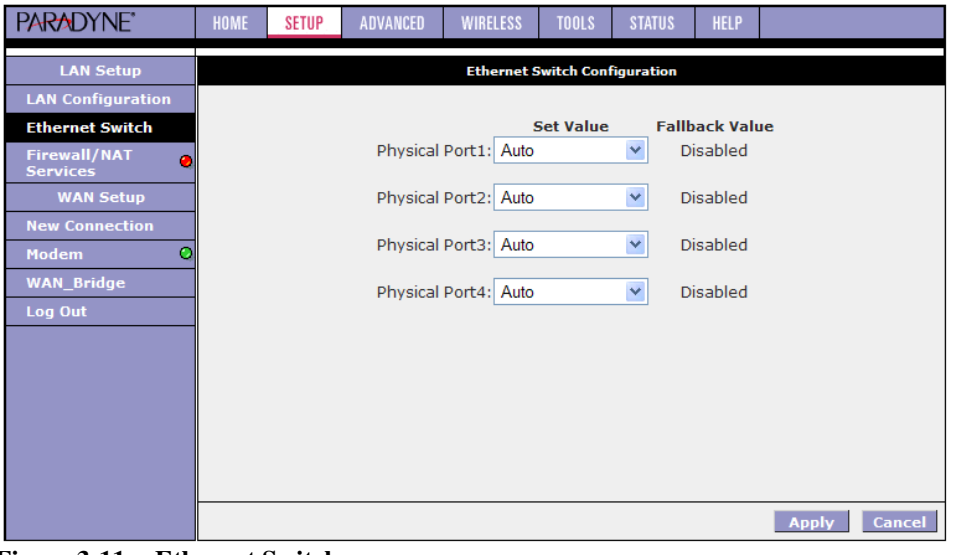


Figure 3-11. Ethernet Switch

Firewall/NAT Services

To enable or disable Firewall and NAT:

▶ Procedure

1. From the Home screen, click Setup.
2. Under LAN Setup, select Firewall/NAT Services. By unselecting the Enable Firewall and NAT Services button the firewall and NAT services is disabled for all WAN connections. Enabling Firewall NAT does not automatically apply it to connections.

The Apply button will temporarily save this setting. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

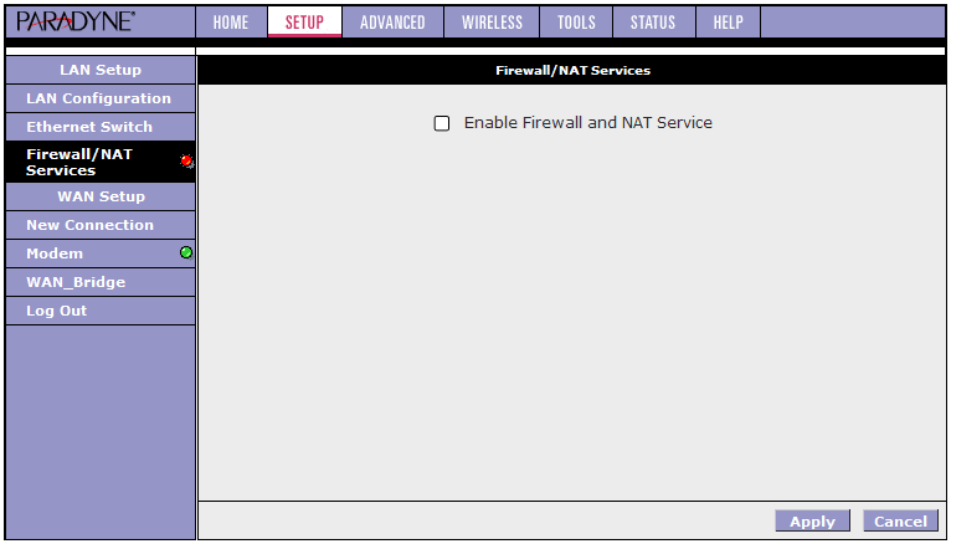


Figure 3-12. Firewall/NAT Services

Advanced

The CPE supports a host of advanced features. For basic router functionality, you do not need to utilize these advanced features. The features help with routing, security, port configuration, and plug and play capability.

UPnP

UPnP NAT and Firewall Traversal allow traffic to pass through the router for applications using the UPnP protocol. This feature requires one active DSL connection. In the presence of multiple DSL connections, select the one over which the incoming traffic will be present, such as the default Internet connection.

To enable UPnP you must first have a WAN connection configured. Once a WAN connection is configured:

▶ Procedure

1. From the Home screen, click on Advanced and under Advanced, select UPnP. The UPnP screen appears.
2. Enable UPnP and then select which connection will utilize UPnP.
3. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

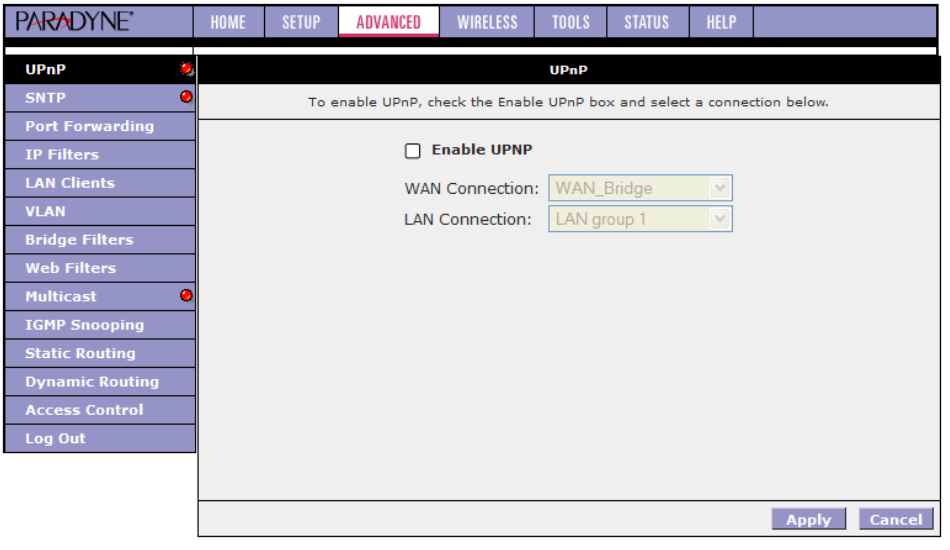


Figure 3-13. UPnP

SNTP

The SNTP screen lets you specify parameters related to SNTP (Simple Network Time Protocol) servers. To use SNTP:

▶ Procedure

1. From the Home screen, click on Advanced and under Advanced, select SNTP. The SNTP screen appears.
2. Enable SNTP and then specify one or more SNTP servers.
3. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

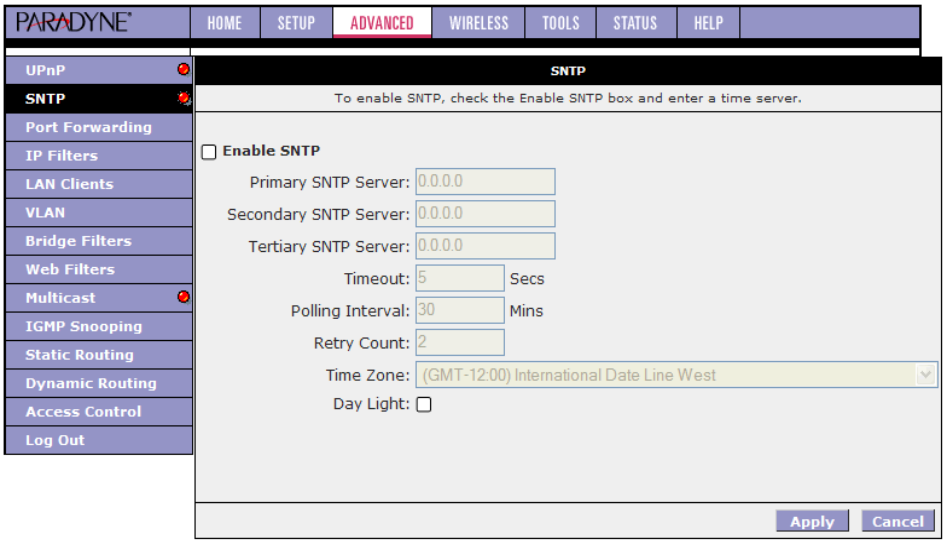


Figure 3-14. SNTP

Port Forwarding

Using the Port Forwarding page you can provide local services (such as web hosting) for people on the Internet. When users send this type of request to your network via the Internet, the router will forward those requests to the appropriate PC. Port forwarding can be used with DHCP-assigned addresses, but remember that a DHCP address is dynamic. If you were configuring a Netmeeting server, for example, you would want to assign this server a static IP address so that the IP address is not reassigned. Also remember that if an Internet user is trying to access an Internet application, they must use the WAN IP address. The port forwarding feature will translate the WAN IP address into a LAN IP address.

You can use the LAN Clients screen to reserve an IP address for a DHCP client. See *LAN Clients* on page 3-23.

To configure a service, game, or other application:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Port Forwarding.
3. Select the computer hosting the service and add the corresponding firewall rule.
4. If you want to add a custom application, select the User category, click on New, and fill in the port, protocols and description for your application.

   For example, if you want to host a Netmeeting session, from the Home screen, click on Advanced and under Advanced, select Port Forwarding. First select the IP address for your Netmeeting server. Next select the Audio/Video category and add Netmeeting to the Applied Rules box. To view the management rules, highlight Netmeeting and select view. This will display the preconfigured protocols and ports that Netmeeting will use. Now you can run Netmeeting from your server and call users that are on the Internet. If they know your WAN IP address, users can call you.
5. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

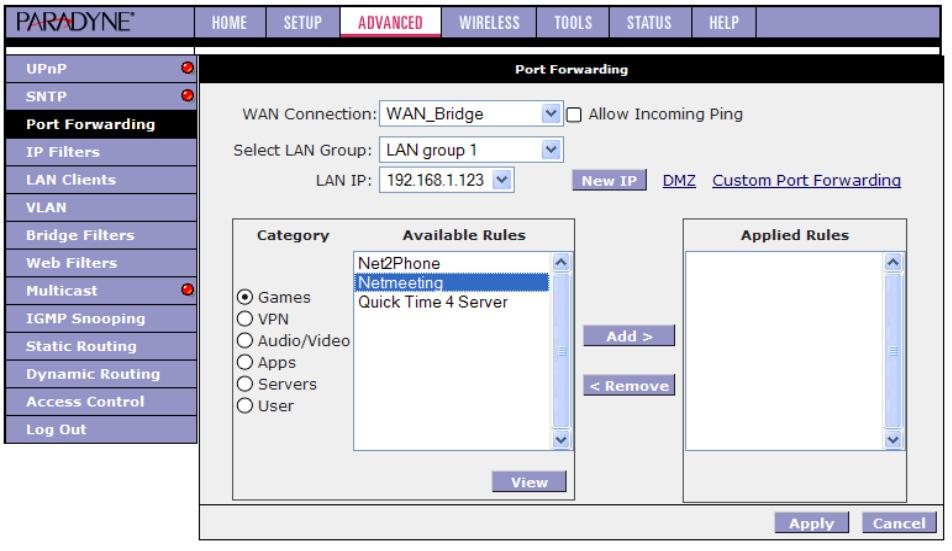


Figure 3-15. Port Forwarding: Netmeeting

IP Filters

Use the IP Filters screen to block all or selected traffic. To set up IP Filters:

▶ Procedure

1. From the Home screen, click on Advanced and under Advanced, select IP Filters. The IP Filters screen appears.
2. Select the LAN Group from the drop-down list that these changes will apply to.
3. Select a LAN IP address from the LAN IP drop-down list. Click on New IP to add a new IP address to the list.
4. Select available rules from the list, or click on Custom IP Filters to create a new rule.
5. Click on Apply. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

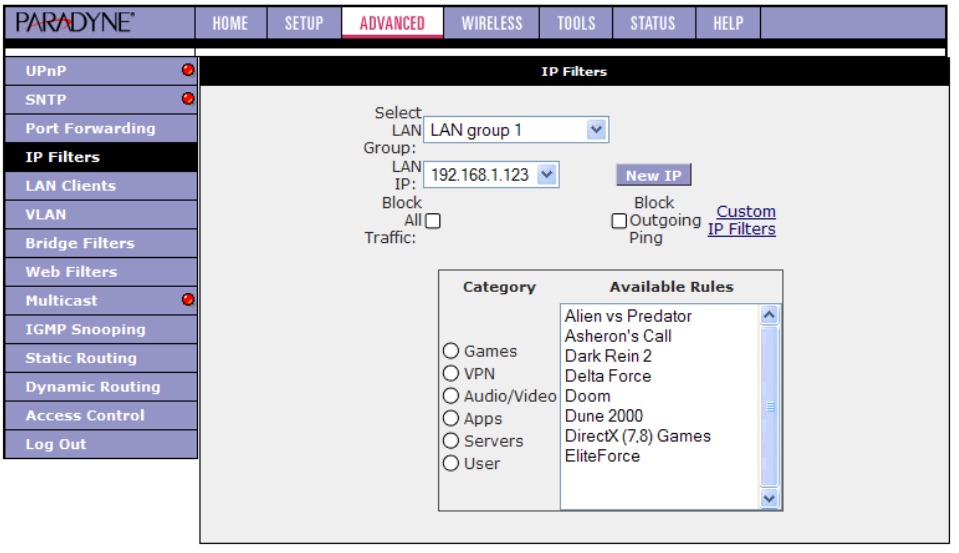


Figure 3-16. IP Filters

LAN Clients

To add a LAN client, or reserve an IP address for a DHCP client:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select LAN Clients. If DHCP is used, all DHCP clients are automatically assigned. If a fixed IP address server is on the LAN and you want this server to be visible via the WAN, you must add its IP address. Once the IP address has been added to you can apply Port Forwarding rules to this IP address.
3. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

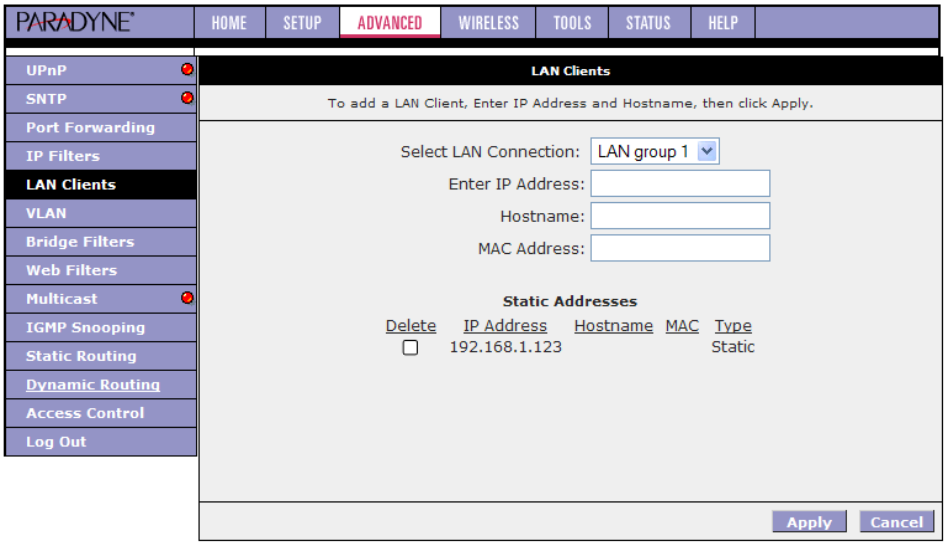


Figure 3-17. LAN Clients

VLAN

You can use the VLAN (Virtual Local Area Network) screen to match different VLAN IDs to the LAN ports.

To configure VLANs:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select VLAN. The VLAN screen appears.
3. Click the appropriate buttons to assign VLAN IDs to the LAN ports.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

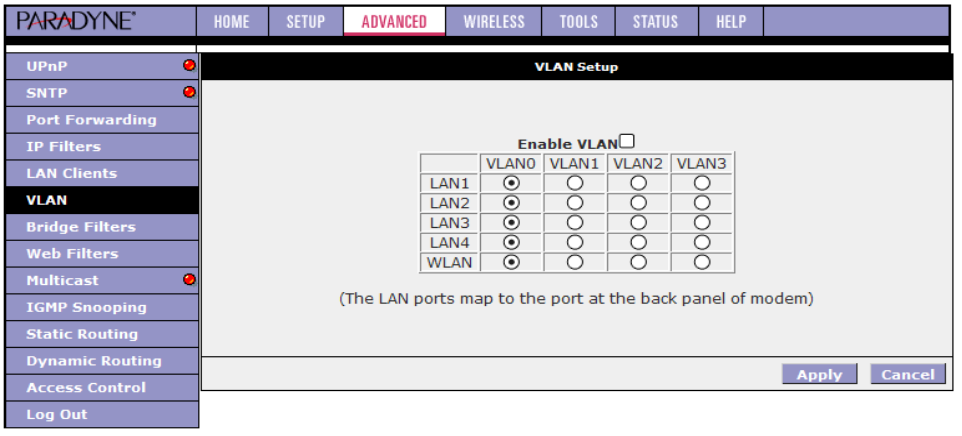


Figure 3-18. VLAN

Bridge Filters

The bridge filtering mechanism provides a way for the users to define rules to allow or deny frames through the bridge based on source MAC address, destination MAC address and/or frame type. When bridge filtering is enabled, each frame is examined against the defined filter rules sequentially, and when a matched is determined, the appropriate filtering action (allow or deny) is performed. The bridge filter will only examine frames from interfaces which are part of the bridge itself. Twenty filter rules are supported with bridge filtering.

To enable Bridge Filters:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Bridge Filters. The Bridge Filters screen appears, as shown in Figure 3-19, Bridge Filters.

The User Interface for Bridge Filter allows the user to add, edit, and delete, as well as enable the filter rules. To add rules, define the source MAC address, destination MAC address, and frame type with the desired filtering action (allow or deny), and click on the Add button. The MAC address must be in a xx-xx-xx-xx-xx-xx format, with 00-00-00-00-00-00 or blanks meaning any address.

To edit or modify an existing filter rule, select the desired rule created previously in the Edit select box. The selected filter rule appears in the top section, as with the Add procedure. Make the desired change to the MAC address, frame type and access type, and click on Apply.

To delete a filter rules, select the filter rule entry to delete in the Delete selection box. Note that multiple deletions are possible. Once all the desired filter rules are selected for deletion, click on the Apply button. The Select All select box can also

be used to delete the entire filter rule. It provides a quick method of selecting all filter rules for deletion.

The Enable Bridge Filters button allows you to enable or disable bridge filtering. It can be set or unset during any add, edit, or delete operation. It can also be set or unset independently by pressing the Apply button.

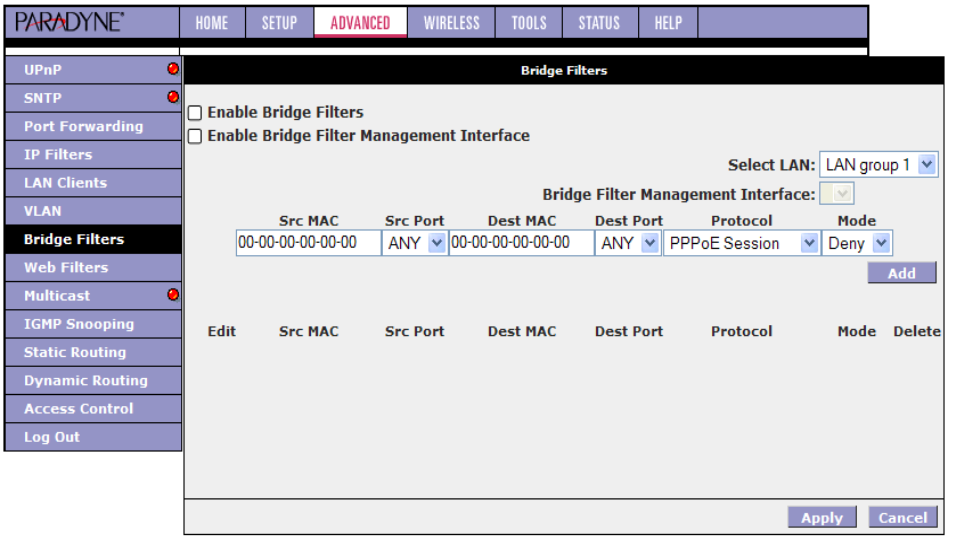


Figure 3-19. Bridge Filters

Note: The bridge filter table contains three hidden rules. These rules are entered automatically by the system to ensure that you don't lock yourself out of the system. The first rule allows all ARP frames through the system. The second rule allows all IPv4 frames with the destination MAC address of the router to go through. The third rule allows all IPv4 frames with the source MAC address of the router to go through.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Note: On a windows based machine, you can find a MAC address with the ipconfig program. At a command prompt, type: **`ipconfig /all`**

Web Filters

This option enables the IGMP proxy, which allows NAT clients to participate in IGMP multicast groups. It should only be enabled if NAT is also enabled.

To enable Multicasting:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Web Filters.
3. Select features to be enabled and disabled over the router.
4. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

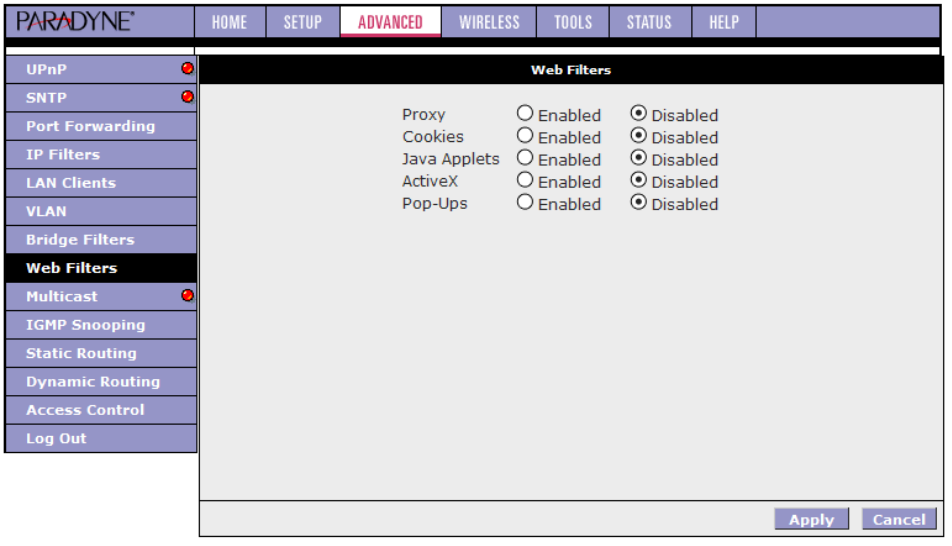


Figure 3-20. Web Filters

Multicast

This option enables the IGMP proxy, which allows NAT clients to participate in IGMP multicast groups. It should only be enabled if NAT is also enabled.

To enable Multicasting:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Muliticast.
3. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

Figure 3-21. Multicast

IGMP Snooping

Use the IGMP Snooping screen to specify whether IGMP Snooping is enabled. When IGMP Snooping is enabled, the router analyzes Internet Group Management Protocol (IGMP) packets to learn multicast group address and port associations.

To enable IGMP Snooping:

1. From the Home screen, click on Advanced.
2. Under Advanced, select IGMP Snooping.
3. Click in the check box to enable snooping.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

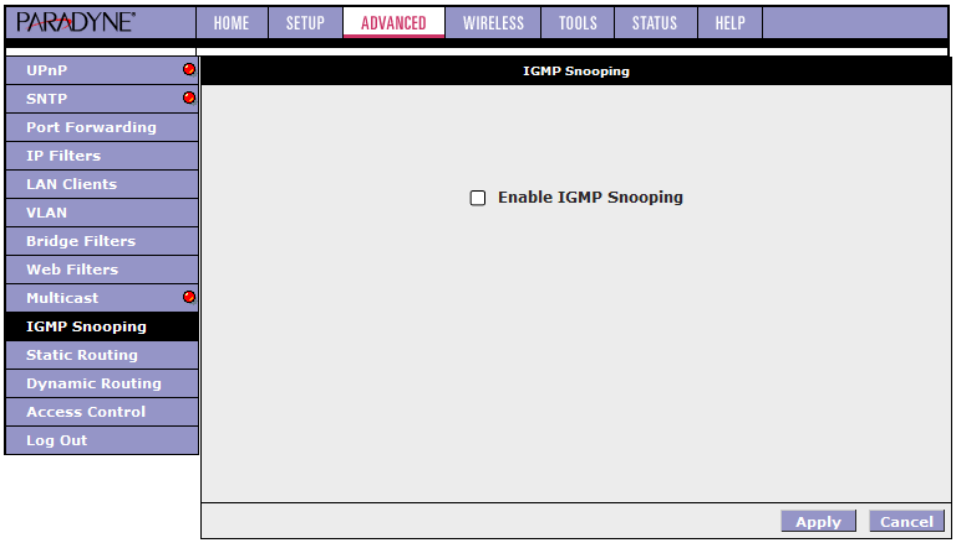


Figure 3-22. IGMP Snooping

Static Routing

If the router is connected to more than one network, you may need to set up a static route between the networks. A static route is a predefined pathway that network information must travel to reach a specific host or network. You can use static routing to allow different IP domain users to access the Internet through the router.

To enable Static Routing:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Static Routing.

3. Specify the New Destination IP. This is the address of the remote LAN network or host to which you want to assign a static route. Enter the IP address of the host for which you wish to create a static route here. For a standard Class C IP domain, the network address is the first three fields of the New Destination IP, while the last field should be 0. The Subnet Mask identifies which portion of an IP address is the network portion, and which portion is the host portion. For a full Class C Subnet, the Subnet Mask is 255.255.255.0.
4. Specify the Gateway address. This is the IP address of the device that allows contact between the router and the remote network or host.
5. Specify the Metric. This determines the maximum number of steps between network nodes that data packets will travel. A node is any device on the network (such as a router or switch).
6. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

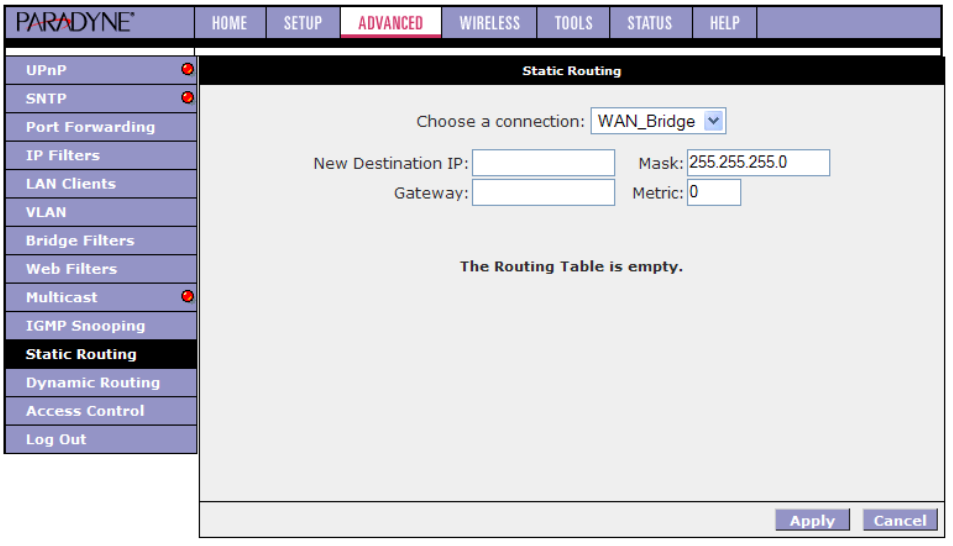


Figure 3-23. Static Routing

Dynamic Routing

Dynamic Routing allows the CPE to automatically adjust to physical changes in the network. The CPE, using the RIP protocol, determines the network packets' route based on the fewest number of hops between the source and the destination. The RIP protocol regularly broadcasts routing information to other routers on the network.

To enable Dynamic Routing:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Dynamic Routing.

3. Specify the Protocol. The protocol is dependent upon the entire network. Most networks support RIP v1. If RIP v1 is selected, routing data will be sent in RIP v1 format. If RIP v2 is selected, routing data will be sent in RIP v2 format using subnet broadcasting. If Rip v1 Compatible is selected, routing data will be sent in RIP v2 format using multicasting.
4. Specify the Direction. This determines the direction that RIP routes will be updated. Selecting In means that the router will only incorporate received RIP information. Selecting Out means that the router will only send out RIP information. Selecting both means that the router will incorporate received RIP information and send out updated RIP information.
5. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

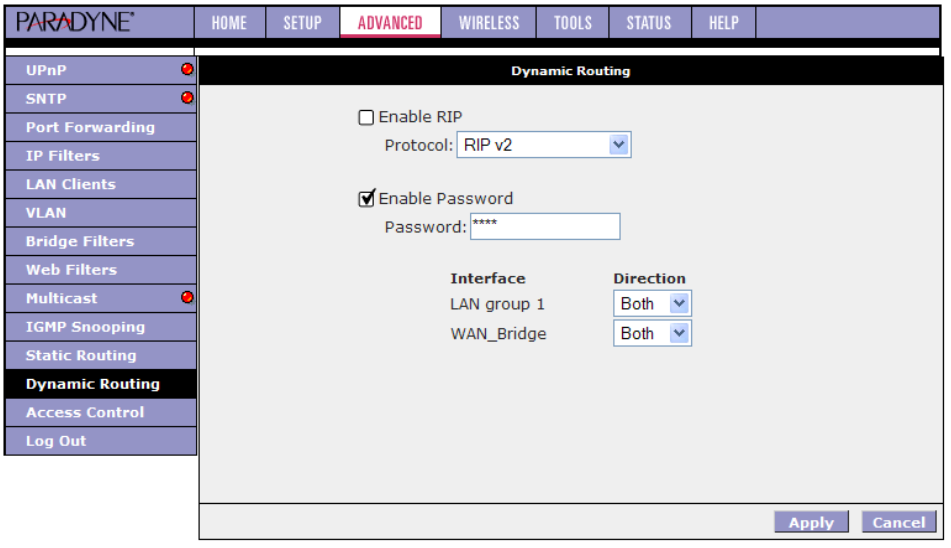


Figure 3-24. Dynamic Routing

Access Control

Access control allows certain PCs to access the router after the firewall is enabled.

Access control is enabled on a WAN connection only if the firewall is enabled globally (see *Firewall/NAT Services* on page 3-17) and enabled on that WAN connection.

To enable any of the Access Control features:

▶ Procedure

1. From the Home screen, click on Advanced.
2. Under Advanced, select Access Control. The Access Control screen appears. All Access Control rules have precedence over rules that were added via the Port Forwarding page.
3. The Apply button will temporarily save these settings. To make the change permanent, click on Tools and select System Commands. On the System Commands page, click on Save All.

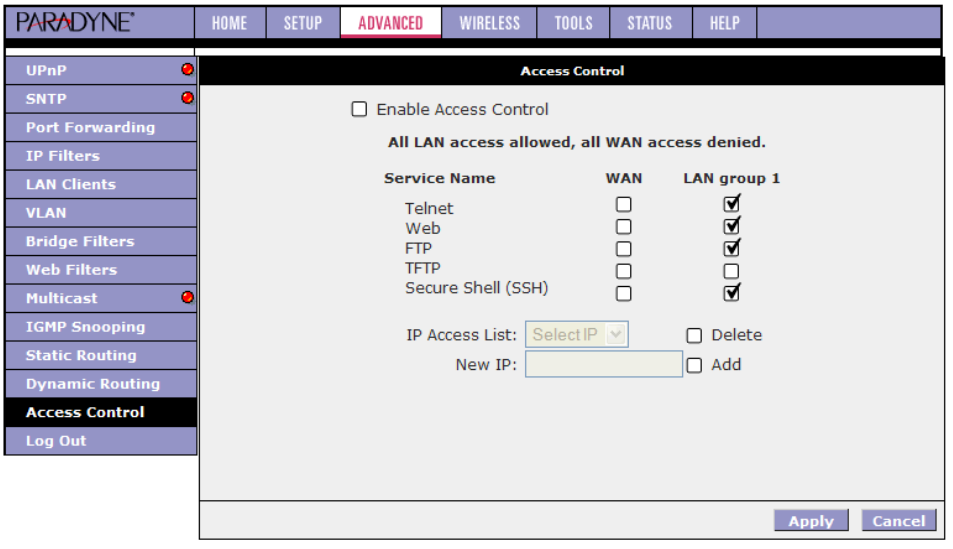


Figure 3-25. Access Control

Log Out

Click on Log Out to close the session.

Wireless

The Wireless tab provides access to screens that let you configure parameters related to the router's wireless LAN connection.

Setup

The Wireless Setup screen contains the wireless LAN user settings.

To change the Wireless Setup:

▶ Procedure

1. From the Home screen, click on the Wireless tab.
2. From the Wireless menu, click on Setup. The Wireless Setup screen appears.
3. Enter or select the parameters described in Table 3-1, Wireless Setup.

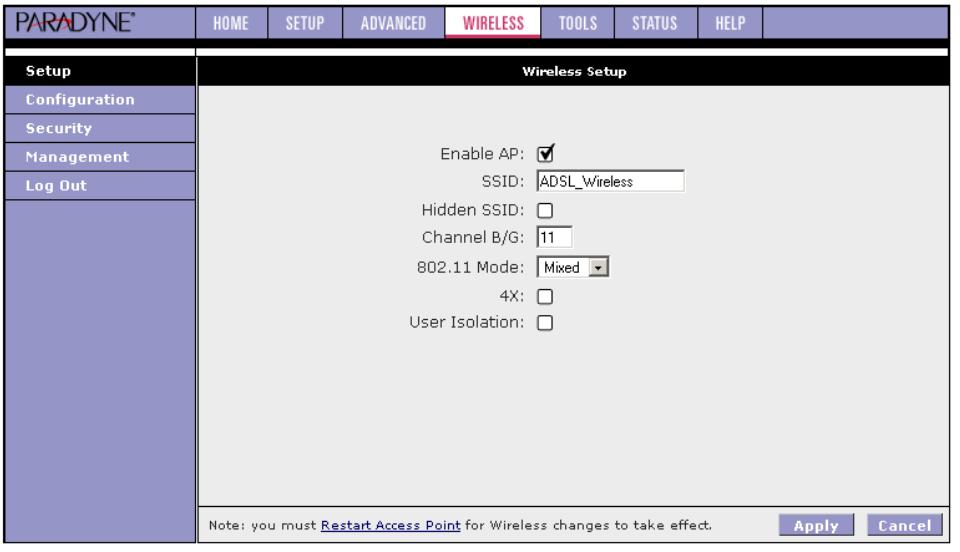


Figure 3-26. Wireless Setup Screen

Table 3-1. Wireless Setup (1 of 2)

Parameter	Description
Enable AP	Enabling the Access Point (AP) turns on the router's wireless capability. To use wireless devices, verify that the box is checked.
SSID	Specify the Service Set IDentifier (SSID) for your wireless LAN. It can be up to 32 characters and cannot include spaces.
Hidden SSID	Enable Hidden SSID by clicking in the check box. When Hidden SSID is enabled, the SSID is not advertised. Users must know the SSID to connect to the wireless LAN.

Table 3-1. Wireless Setup (2 of 2)

Parameter	Description
Channel B/G	Specify the RF (Radio Frequency) channel (1–11) for the router to use. Recommended values are 1, 6, and 11. These three values do not overlap and could be used by three neighboring wireless LANs.
802.11 Mode	Specify whether the router will support only 802.11b (11 Mbps) clients, only 802.11b+ clients (22 Mbps), only 802.11g (54 Mbps) clients, or all. To allow any client to connect, select Mixed.
4X	Enable 4X mode only if all clients that will connect to the wireless LAN support 802.11b+.
User Isolation	Select if you want to forbid communication between users on the wireless LAN.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All. Then turn off and turn on the router to put the settings into effect.

Configuration

The Wireless Configuration screen contains the wireless LAN operational settings. Do not change anything on the Wireless Configuration screen unless you are so directed by your ISP.

To view the Wireless Configuration settings:

▶ Procedure

1. From the Home screen, click on the Wireless tab.
2. From the Wireless menu, click on Configuration. The Wireless Configuration screen appears.

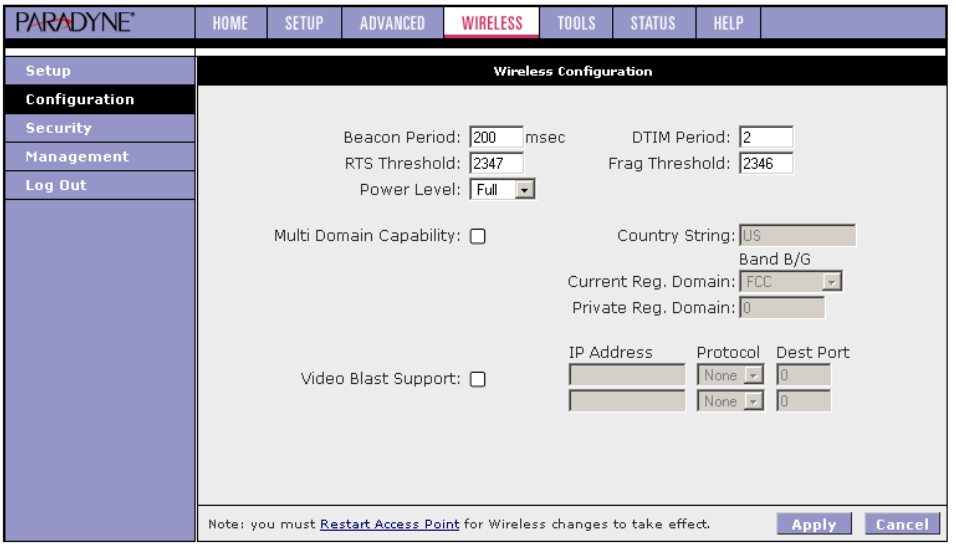


Figure 3-27. Wireless Configuration Screen

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All. Then turn off and turn on the router to put the settings into effect.

Security

The Wireless Security screen contains the settings for applying security to your wireless LAN.

To change Wireless Security:

▶ Procedure

1. From the Home screen, click on the Wireless tab.
2. From the Wireless menu, click on Security. The Wireless Security screen appears.

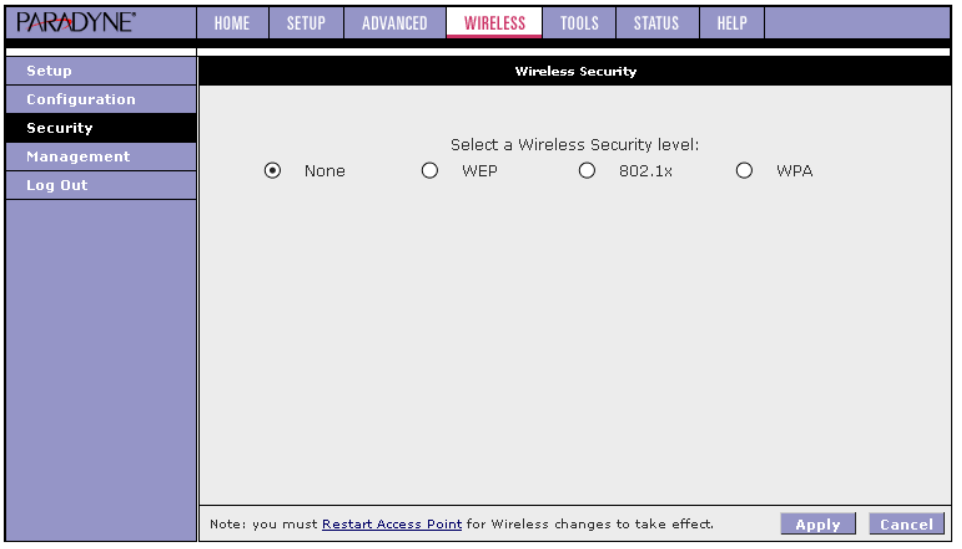


Figure 3-28. Wireless Security Screen

3. Select a security type:

   — None. Anyone can connect to the wireless LAN.

   — WEP (Wired Equivalent Privacy). Users of the wireless LAN must supply an encryption key, as defined on this screen. If an Authentication Type of Shared is selected, the client must properly encrypt a packet sent by the router using the encryption key; however, this method allows hackers to deduce the key. An Authentication Type of Open is recommended.

Figure 3-29. Wireless Security WEP Screen

   — 802.1x. This security level uses a RADIUS (Remote Authentication Dial-In User Service) authentication server to manage network access. Specify

the address of the RADIUS server, the Port, the shared Secret, and the Interval in seconds at which authentication must be repeated.

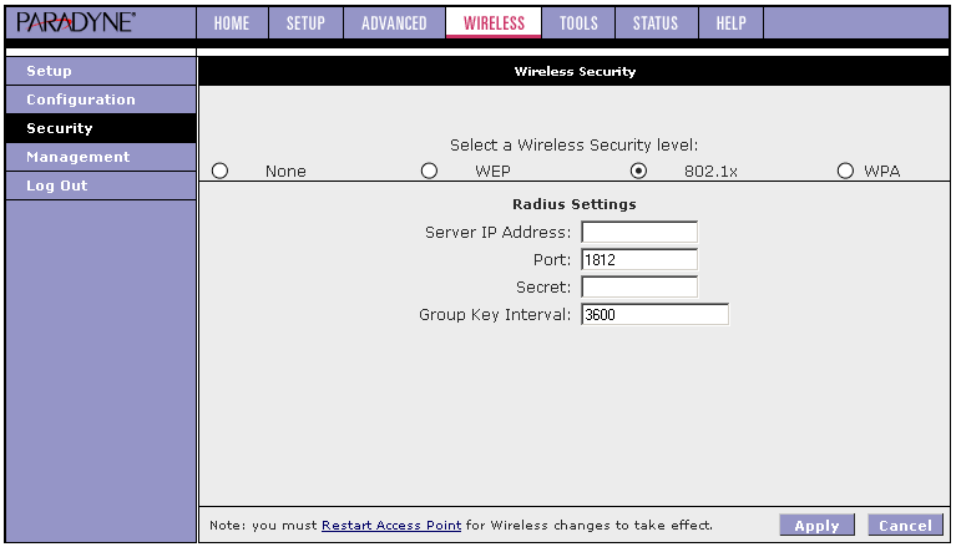


Figure 3-30. Wireless Security 802.11x Screen

— WPA (Wi-Fi Protected Access). For WPA you can specify a RADIUS server (as with 802.1x, above) or a Pre-Shared Key (PSK).

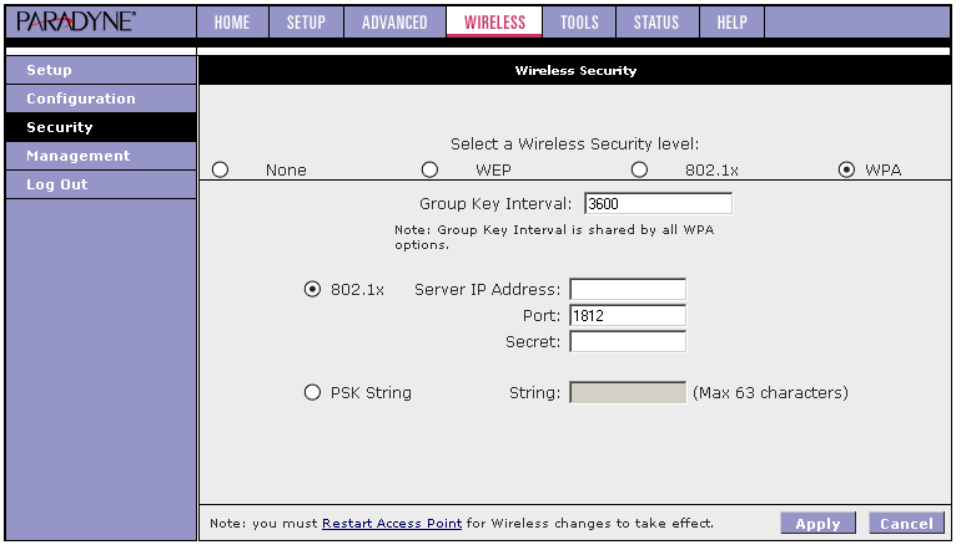


Figure 3-31. Wireless Security WPA Screen

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All. Then turn off and turn on the router to put the settings into effect.

Management

The Wireless Management screen allows you to control access, display clients, and establish multiple SSIDs.

To use Wireless Management:

▶ Procedure

1. From the Home screen, click on the Wireless tab.
2. From the Wireless menu, click on Management. The Wireless Management screen appears.
3. Select:
   — Access List – To allow or deny access to the wireless LAN by MAC address. Enable the access list, then add allowed or denied MAC addresses.

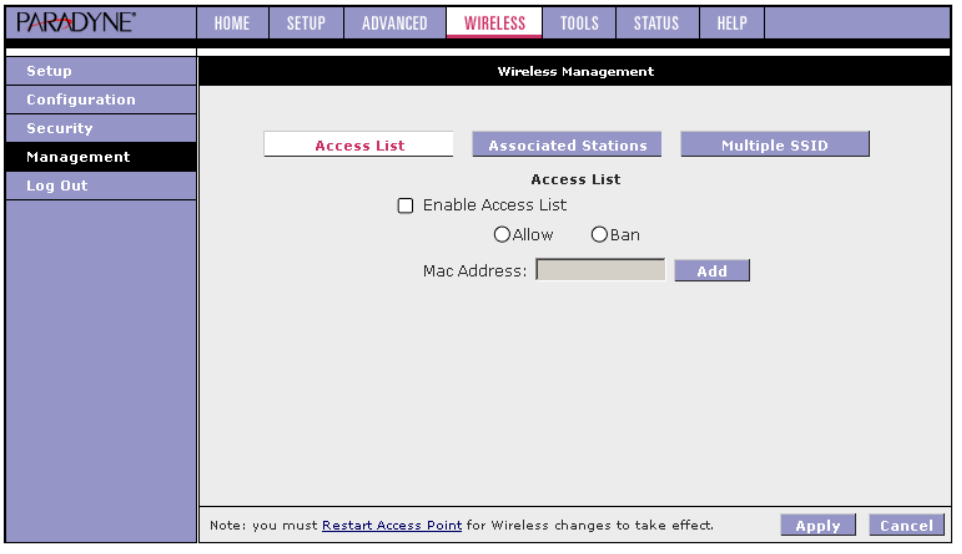


Figure 3-32. Wireless Management Access List Screen

— Associated Stations – To display wireless clients currently connected to the router.

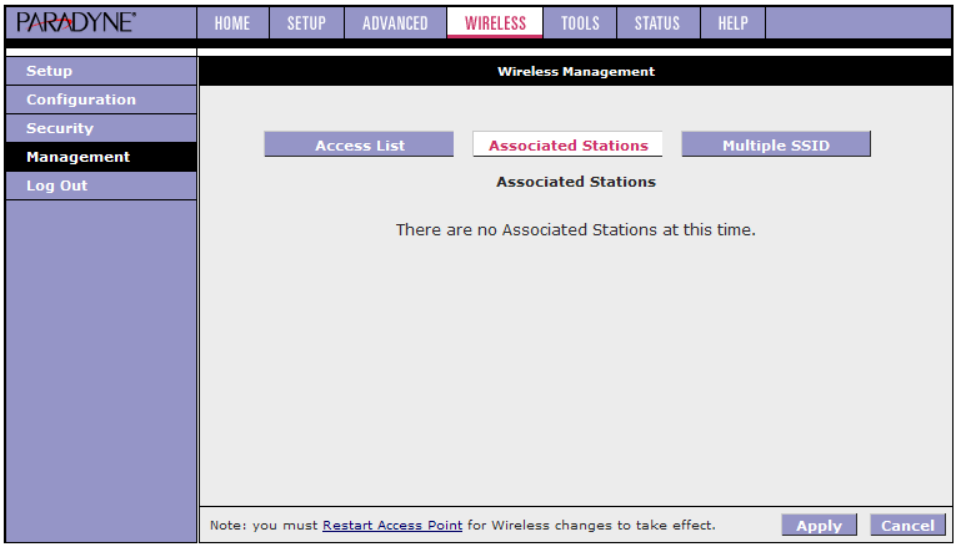


Figure 3-33. Wireless Management Associated Stations Screen

— Multiple SSIDs – To cause the router to advertise the wireless LAN using more than one Service Set IDentifier (SSID).

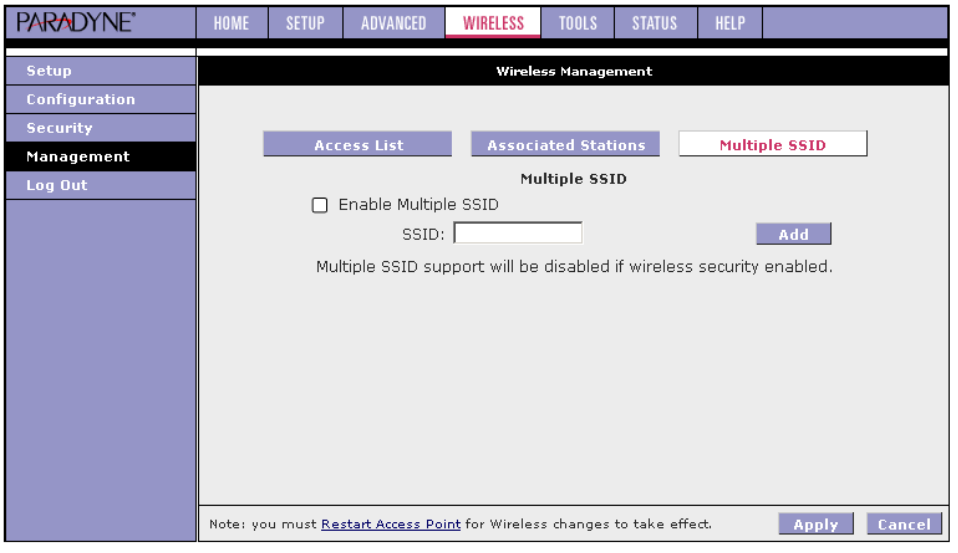


Figure 3-34. Wireless Management Multiple SSID Screen

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All. Then turn off and turn on the router to put the settings into effect.

Tools

The Tools tab provides access to system commands and functions.

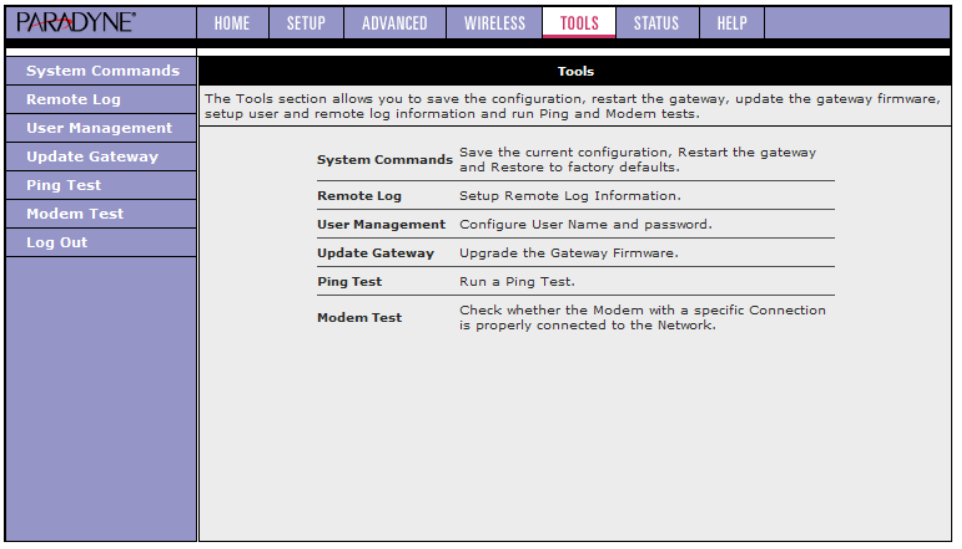


Figure 3-35. Tools Screen

System Commands

To make changes permanent, click on Tools (at the top of the page) and select System Commands. The following commands are used to configure the router:

- Save All: Click on this button in order to permanently save the current configuration of the router. If you do restart the system without saving your configuration, the CPE will revert back to the previously saved configuration.
- Restart: Use this button to restart the system. If you have not saved your configurations, the router will revert to the previously saved configuration upon restarting. Connectivity to the unit will be lost. You can reconnect after the unit reboots.
- Restore Defaults: Use this button to restore factory default configuration. Connectivity to the unit will be lost. You can reconnect after the unit reboots.

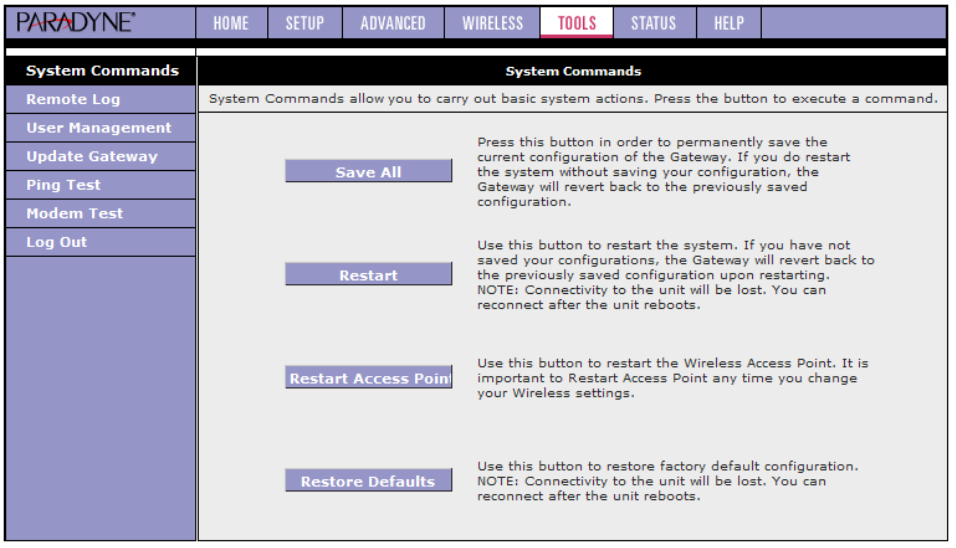

PARADYNE
HOME
SETUP
ADVANCED
WIRELESS
TOOLS
STATUS
HELP
System Commands
Remote Log
User Management
Update Gateway
Ping Test
Modem Test
Log Out
System Commands
System Commands allow you to carry out basic system actions. Press the button to execute a command.
Save All
Press this button in order to permanently save the current configuration of the Gateway. If you do restart the system without saving your configuration, the Gateway will revert back to the previously saved configuration.
Restart
Use this button to restart the system. If you have not saved your configurations, the Gateway will revert back to the previously saved configuration upon restarting. NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.
Restart Access Poin
Use this button to restart the Wireless Access Point. It is important to Restart Access Point any time you change your Wireless settings.
Restore Defaults
Use this button to restore factory default configuration. NOTE: Connectivity to the unit will be lost. You can reconnect after the unit reboots.

Figure 3-36. System Commands

Remote Log

The remote log feature forwards all logged information to a remote PC. The type of information forwarded to the remote PC depends upon the log level. Each log message is assigned a severity level, which indicates how seriously the triggering event affects router functions. When you configure logging, you must specify a severity level for each facility. Messages that belong to the facility and are rated at that level or higher are logged to the destination.

For PPPoE and PPPoA connections, you can select Debug if you want to log the connection information. This is helpful when trying to debug connection problems.

Table 3-2 defines the different severity levels.

Table 3-2. Severity Levels

Severity Level	Description
Panic	System panic or other condition that causes the router to stop functioning.
Alert	Conditions that require immediate correction, such as a corrupted system database.
Citical	Potentially critical conditions, such as hard drive errors.
Error	Error conditions that generally have less serious consequences than errors in the panic, alert, and critical levels.
Warning	Conditions that warrant monitoring.
Notice	Conditions that are not errors but might warrant special handling.
Info	Events or non-error conditions of interest.
Debug	Software debugging messages. Specify this level only if so directed by your technical support representative.

To forward logging information:

▶ Procedure

1. Click on Tools and select Remote Log.
2. Select a Log Level from the drop-down list.
3. Type the IP address of the remote logging destination and click on Add.
4. Click on Apply. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

Figure 3-37. Remote Log

User Management

To change your router's username and password:

▶ Procedure

1. From the Home screen, under the tools menu, click on User Management.
2. Change the login name and password.
3. If desired, you can change the idle timeout from this screen. The idle timeout determines after how many minutes of inactivity the web interface is logged off.

The Apply button will temporarily save these settings. To make the change permanent, click on Tools (at the top of the page) and select System Commands. At the System Commands page, click on Save All.

If you forget your password, you can press and hold the reset to factory defaults button for 10 seconds. The router will be reset to its factory default configuration and all custom configurations will be lost.

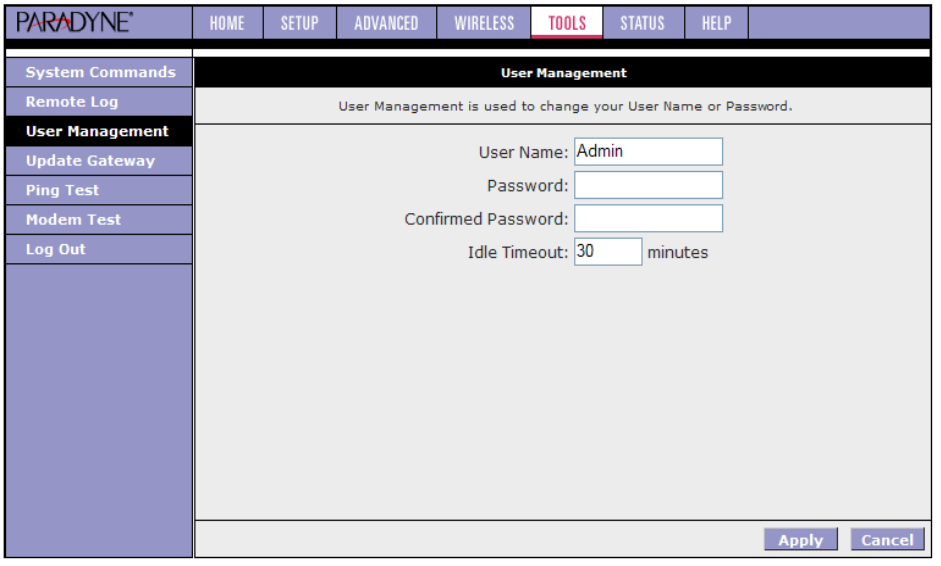


Figure 3-38. User Management

Update Gateway

You can remotely upgrade the router's firmware from the web interface.

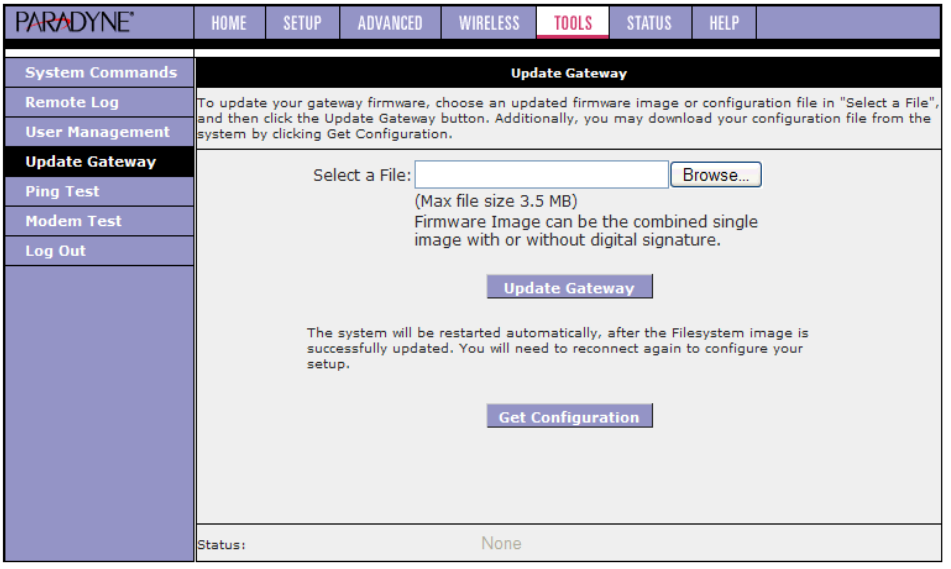
To upgrade the firmware:

▶ Procedure

1. From the Home screen, under the Tools title, click on Update Gateway.
2. Click on Browse, and find the firmware file to download. Make sure this is the correct file.
3. Click on upgrade firmware. Once the upgrade is complete the CPE will reboot. You will need to log back onto the CPE after the firmware upgrade is complete.

The firmware upgrade should take less that 5 minutes to complete. If it takes longer than 5 minutes, something has gone wrong.

Caution: Do not remove power from the router during the firmware upgrade procedure.


PARADYNE
HOME
SETUP
ADVANCED
WIRELESS
TOOLS
STATUS
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Ping Test
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Log Out
Update Gateway
To update your gateway firmware, choose an updated firmware image or configuration file in "Select a File", and then click the Update Gateway button. Additionally, you may download your configuration file from the system by clicking Get Configuration.
Select a File:
Browse...
(Max file size 3.5 MB)
Firmware Image can be the combined single image with or without digital signature.
Update Gateway
The system will be restarted automatically, after the Filesystem image is successfully updated. You will need to reconnect again to configure your setup.
Get Configuration
Status:
None

Figure 3-39. Update Gateway

Ping Test

Once you have your router configured, it is a good idea to make sure you can ping the network. If you have your PC connected to the router via the default DHCP configuration, you should be able to ping the network address 192.168.1.2. If your ISP has provided their server address you can try to ping that address. If the pings for both the WAN and the LAN side are successful, and you have the proper protocols configured, you should be able to access the Internet.

To run a ping test:

▶ Procedure

1. From the Home screen, under the Tools title, click on Ping Test.
2. Specify the target IP Address that you want to ping.

   Optionally, specify:

   — TOS Byte value. This is part of the IP header of the ping packet. Valid values are 0 to 255.

   — Packet size. Valid values are 36 to 65507.

   — Number of echo requests. Valid values are 1 to 9.
3. Click on Test.

By default, when you select ping test, the router will ping itself three times. In Figure 3-40, the router passed the Ping Test; this basically means that the TCP/IP protocol is up and running. If this first test does not pass, the TCP/IP protocol is not loaded. In this case, restart the router.

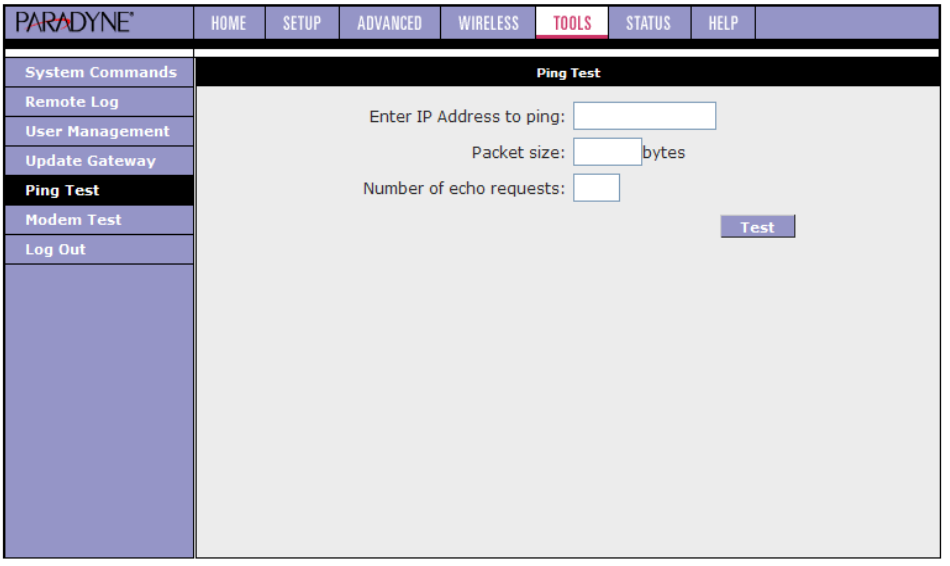


Figure 3-40. Ping Test

Modem Test

The Modem Test is used to check whether your router is properly connected to the WAN Network by running OAM F4 and F5 end-to-end and segment tests. The test may take a few seconds to complete. To perform the test, select your connection from the list, select a Test Type, and click on the Test button.

Before running this test, make sure you have a valid DSL link; if the DSL link is not connected, this test will always fail. Also, the DSLAM must support this feature. Not all DSLAMs have OAM F4 and F5 support.

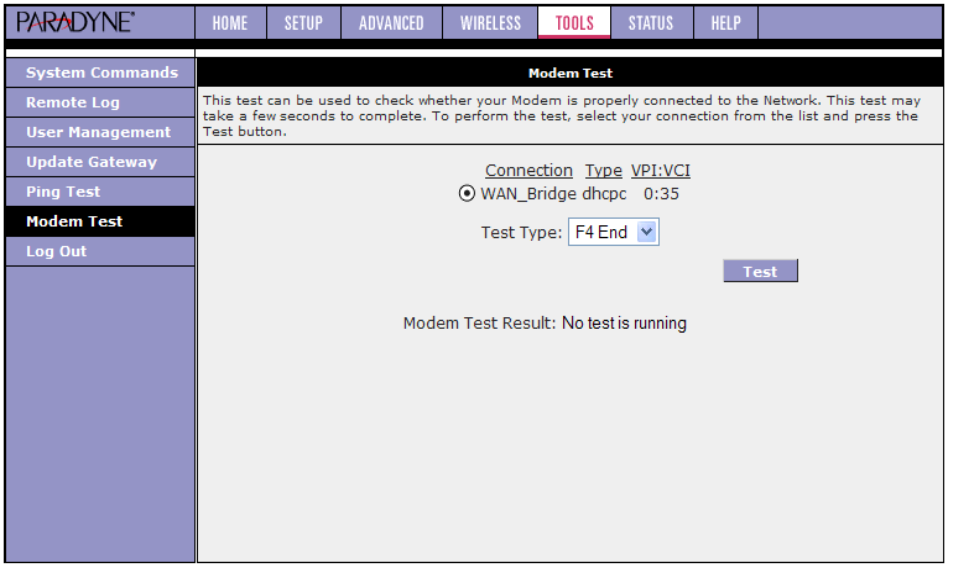


Figure 3-41. Modem Test

Status

The Status section allows you to view the Status/Statistics of different connections and interfaces:

- Network Statistics – Select to view the Statistics of the Ethernet and DSL interfaces, as shown in Figure 3-42.

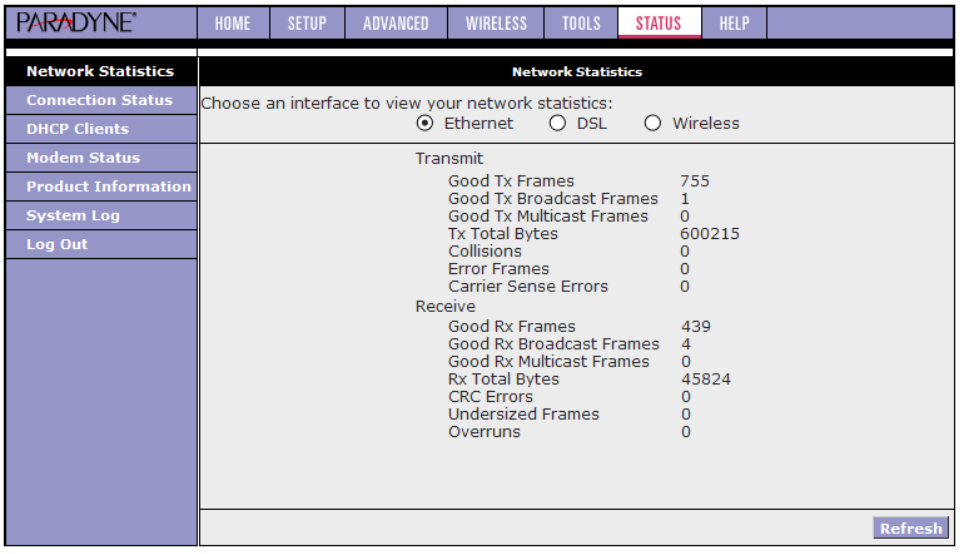


Figure 3-42. Network Statistics

- Connection Status – Select to view the Status of different connections.
- DHCP Clients – Select to view the list of DHCP clients.
- Modem Status – Select to view the Status and Statistics of your broadband (DSL) connection, as shown in Figure 3-43.

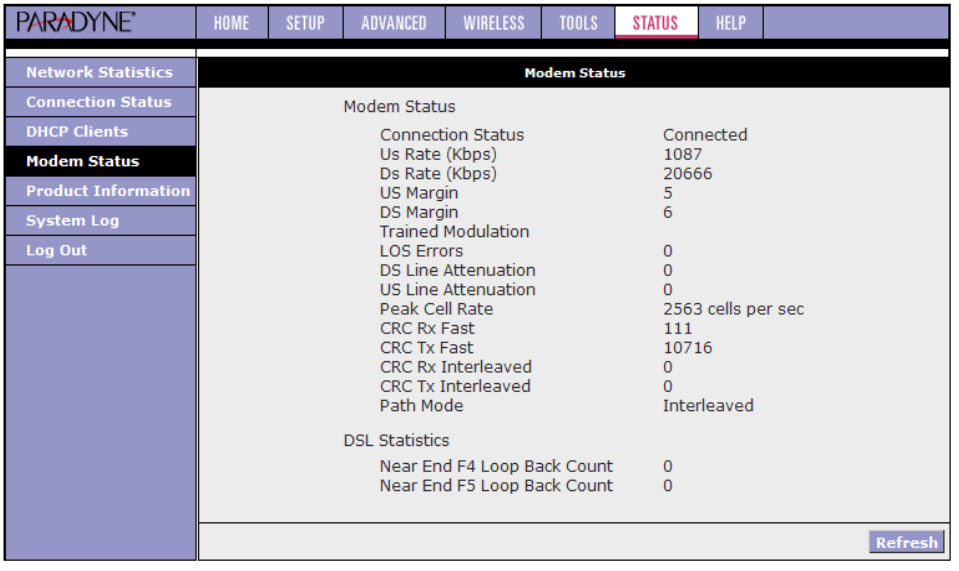


Figure 3-43. Modem Status

- Product Information – Select to view the router's driver and run-time information, as shown in Figure 3-44.

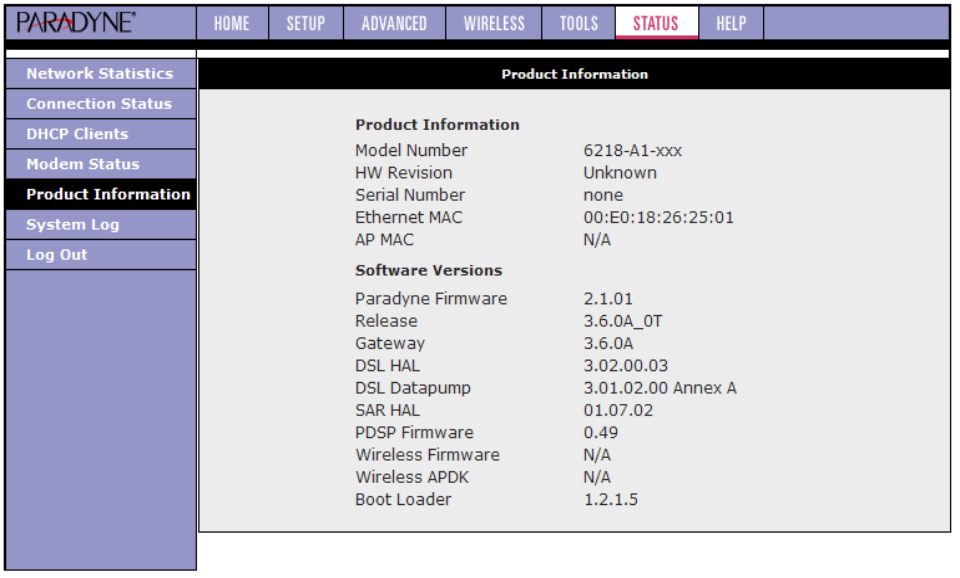


Figure 3-44. Product Information

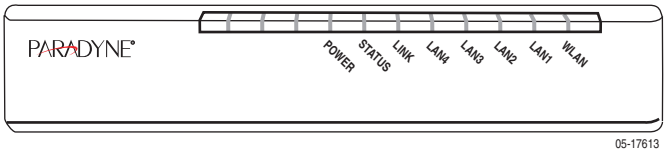
- System Log – Select to view all logged information. Depending upon the severity level, this logged information will generate log reports to a remote host (if remote logging is enabled).

Troubleshooting

4

The Router Is Not Functional

1. Check to see that the power LED is green and than the network cables are installed correctly. Refer to *Connecting the Hardware* in Chapter 2, *Hardware Installation and PC Setup* for more details.
2. Check to see that the LAN and STATUS LEDs are green.
3. Check to see that the STATUS LED is green.



4. Check the settings on your PC. Again, refer to the quick start guide for more details
5. Check the router's settings.
6. From your PC, can you ping the router? Assuming that the router has DHCP enabled and your PC is on the same subnet as the router, you should be able to ping the router.
7. Can you ping the WAN? Your ISP should have provided the IP address of their server. If you can ping the router and your protocols are configured correctly, you should be able to ping the ISP's network. If you cannot ping the ISP's network, make sure you are using the correct protocols with the correct VPI/VCI values.
8. Make sure NAT is enabled if you are using private addresses on the LAN ports.

You Cannot Connect to the Router

1. Check to see that the power LED is green and that the network cables are installed correctly.
2. Make sure that your PC and the router are on the same network segment. The router's default IP address is 192.168.1.1. If you are running a Windows-based

PC, type ipconfig /all (or winipcfg /all on Windows 95, 98, or ME) at a command prompt to determine the IP address of your network adapter. Make sure that it is within the same 192.168.1.x subnet. Your PC's subnet mask must match the router's subnet mask. The router has a default subnet mask of 255.255.255.0.

3. Make sure NAT is enabled if you are using private addresses on the LAN ports.

LEDs Blink in a Sequential Pattern

This typically means that either the kernel or flash file system is corrupted. Notify your service representative.

Status LED Continues to Blink

This means that the DSL line is trying to train but for some reason it cannot establish a valid connection. The main cause of this is that you are too far away from the central office. Contact your DSL service provider for further assistance.

Status LED is Always Off

1. Make sure you have DSL service. You should receive notification from your ISP that DSL service is installed. You can usually tell if the service is installed by listening to the phone line: you will hear some high-pitched noise. If you do not hear high-pitched noise, contact your ISP.
2. Verify that the phone line is connected directly to the wall and to the line input on the router. If the phone line is connected to the phone side of the router or you have a splitter installed on the phone line, the DSL light will not come on.

Terminology

A

What is a Firewall?

A firewall is protection between the Internet and your local network. It acts as the firewall in your car does, protecting the interior of the car from the engine. Your car's firewall has very small opening that allow desired connections from the engine into the cabin (gas pedal connection, etc), but if something happens to your engine, you are protected.

The firewall in the router is very similar. Only the connections that you allow are passed through the firewall. These connections normally originate from the local network, such as users web browsing, checking e-mail, downloading files, and playing games. However, you can allow incoming connections so that you can run programs like a web server.

What is NAT?

NAT stands for Network Address Translation. Another name for it is Connection Sharing. What does this mean? Your ISP provides you with a single network address to access the Internet with. However, you may have several machines on your local network that want to access the Internet at the same time. The router provides NAT functionality that converts your local network addresses to the single network address provided by your ISP. It keeps track of all these connections and makes sure that the correct information gets to the correct local machine.

Occasionally, there are certain programs that don't work well through NAT. Some games and other specialty applications have a bit of trouble. The router contains special functionality to handle the vast majority of these troublesome programs and games. NAT does cause problems when you want to run a server. See the DMZ section below.

What is a DMZ?

DMZ really stands for Demilitarized Zone. It is a way of separating part of your local network so that is more open to the Internet. Suppose that you want to run a web server, or a game server. Normal servers like these are blocked from working by the NAT functionality. The solution is to isolate the single local computer into a DMZ. This makes the single computer look like it is directly on the Internet, and others can access this machine.

Your machine isn't really directly connected to the Internet, and it really has an internal local network address. When you provide the server's network address to others, you actually provide the address of the router. The router fakes the connection to your machine.

You should use the DMZ when you want to run a server that others will access from the Internet. Internal programs and servers (like print servers) should not be connected to the DMZ.

What is a Router?

The Internet is so large that a single network cannot handle all of the traffic and still deliver a reasonable level of service. To overcome this limitation, the network is broken down into smaller segments or subnets that can deliver good performance for the stations attached to that segment. This segmentation solves the problem of supporting a large number of stations, but introduces the problem of getting traffic from one subnet to another.

To accomplish this, devices called routers are placed between segments. If a machine wishes to contact another device on the same segment, it transmits to that station directly using a simple discovery technique. If the target station does not exist on the same segment as the source station, then the source actually has no idea how to get to the target.

One of the configuration parameters transmitted to each network device is its default gateway. This address is configured by the network administrators and it informs each personal computer or other network device where to send data if the target station does not reside on the same subnet as the source. If your machine can reach all stations on the same subnet (usually a building or a sector within a building), but cannot communicate outside of this area, it is usually because of an incorrectly configured default gateway.

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